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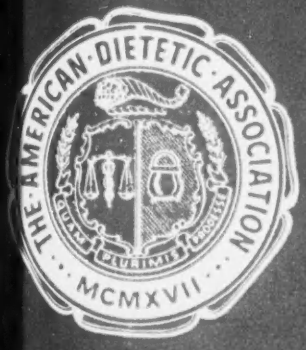

38th A.D.A. Annual Meeting St. Louis October 18–21, 1955

That Kitchen—Let's Try It for Size — *John W. Hargrave*

Management and Organization — *Margaret L. Mitchell*

Nutrition and Health of Gold Coast Children
1. Food in Four Communities
2. Care and Physical Status of Children — *Faye W. Grant*

Psychologic Changes in Starvation with Hard Labor — *Josef Brožek*

Effect of Alloxan in Rats Fed Different Types of Carbohydrate — *Helen B. Leonard et al.*

Reports on Mass Feeding Demonstration, Operation Cue — *Hazel A. Fehlmann, Elsie Wells Russell, and Dorothy L. Bovee*

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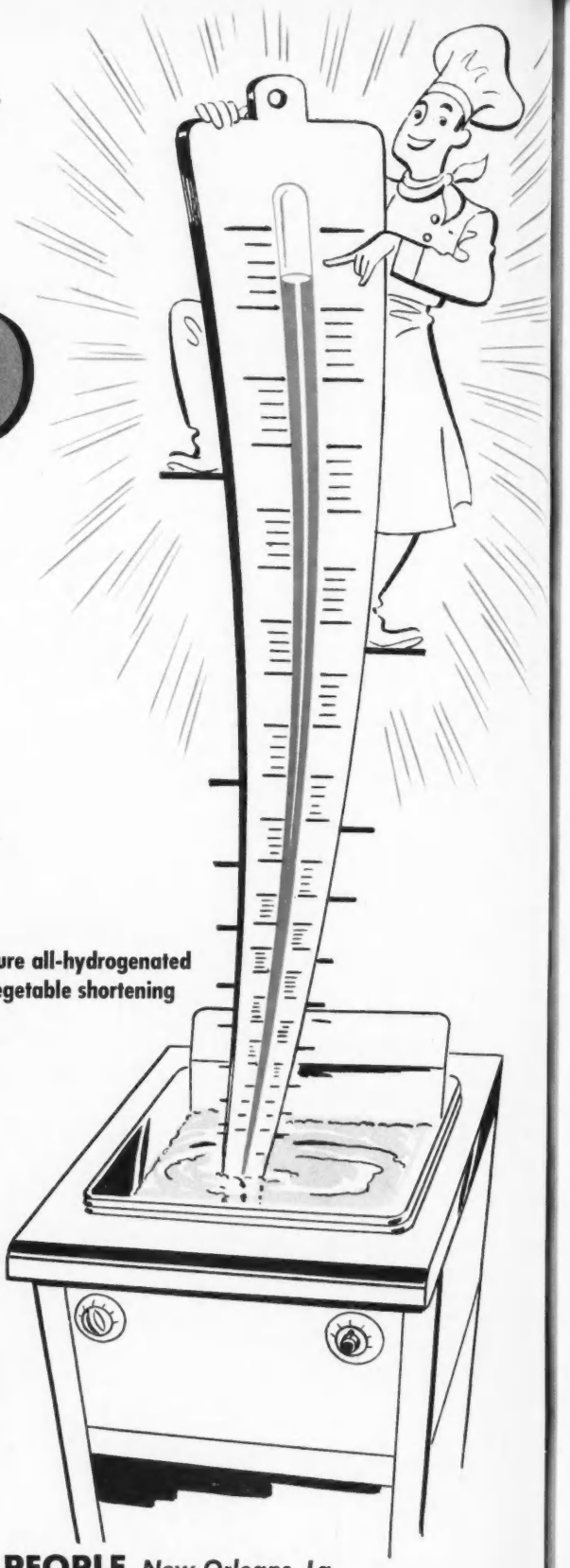

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That Kitchen—Let's Try It for Size[1]

JOHN W. HARGRAVE, A.I.A.

Architect and Consultant, Montgomery, Ohio

SOONER or later each architect learns that there is another professional person called a dietitian, someone vaguely associated in his mind with white starched uniforms and his ulcers. Possibly his knowledge is acquired with a shock, for if he has spelled the title on his drawings with a "c" instead of the second "t" and has assumed that he may relegate cooking and its related functions to spaces between the boiler room and the trash barrels, a militant dietitian may have descended upon his air-castle of plans with a swoop which leaves him wondering if she is a witch or an angel in white.

It has been my privilege to know and work with many of the outstanding architects in the United States. They have one characteristic in common—an ability to grasp a problem of the needs of many people and functions in a building project, and having learned the particulars of each, to combine spaces and activities so that each will perform smoothly and in harmony with all other functions. Having this talent which he has acquired by sweat and experience, the architect achieves not only functional harmony, but pleasing appearance and durable construction as well.

In the normal contract between an architect and his client, there is a delegation of responsibilities to each party. The owner agrees to furnish the architect an exact description of all the requirements which he has for the building. To do this, he may rely on his own skill, on his staff, or on the services of a consultant employed for that purpose. If he chooses the latter method, the consultant will listen to the staff and will produce a program for the architect's use which the owner and his associates understand and approve.

In this phase of planning, the dietitian has an opportunity which should be utilized. Possibly it is a "speak now or forever hold your peace" situation, for she will be expected to do her work well when the new kitchen is completed, and she has a right to the facilities necessary. Hence the title of this paper, "That Kitchen—Let's Try It for Size."

[1] Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 28, 1954.

TESTS OF A GOOD EQUIPMENT PLAN

One of the best methods to check any advance planning is to try to duplicate another tried and tested arrangement and a combination of such features as are considered good in several different kitchens, or mentally to "work" a plan through all of its projected uses. If a dietitian has a record of past menus and the quantities of each item required for each meal during a period of a month—or for one week in each of the four seasons—which she can interpolate to the projected number of persons to be fed daily, she can tell rather accurately what she will need to do the job anticipated.

In her planning, the dietitian will first investigate and learn the answers to many questions of policy which would affect her work. These include:

(1) Is the menu of a general or a specialized nature? If limited, what equipment is required for the specialties offered?

(2) In what quantities and at what intervals will food and supplies be purchased and received?

(3) Will foods come in bulk, semi-fabricated, frozen, or canned form? What equipment will be required if no preparation work is done before delivery?

(4) How large a variety of foods must be stocked to fill the menu?

(5) What is the maximum demand for food to be completed at any one moment? What is the total estimated food volume for each meal, and how will the anticipated cooking schedule work out?

(6) What about garbage and trash disposal and salvage operations?

(7) Will employee facilities be located elsewhere, or entirely in the kitchen area?

(8) What type of service is desired for the patrons?

(9) What about comfort facilities for the patrons?

(10) What about dining room decor: decorations, lighting, seating arrangements?

DETERMINING EQUIPMENT SIZES

Having determined the basic policies of the operation, the schedules, volumes, and menus, the dietitian is ready to test each facility and to see if it fits into a logical pattern of operation. Does the plan

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provide the proper tools and spaces for each job? Is any part too large or too small?

As an example of such testing, let us consider the simple operation of peeling potatoes. From her studies, the dietitian knows that the average volume of potatoes will approximate a certain total daily; let us assume that it will be 2 bu. Now vegetable peelers come in a variety of sizes, up to 1 bu. Which size shall we choose? First, who will do the work? If a girl, possibly the peck size would be best because a girl would not normally be expected to handle more than 15 lb. potatoes at one time when loading a peeler. The peeler takes about 1 min. to peel each batch. Therefore, even with limited efficiency, 8 pecks of potatoes would be peeled in 15 min., and the use of a larger peeler would save very little if any time. Thus, the smaller machine which handles a woman-sized load would appear to have merit.

In similar studies, I have noticed that women are better satisfied with two 20-qt. mixing machines instead of one 60-qt. machine, and that they prefer to use small kettles to larger ones. Of course, in large operations where foods are handled in big volumes, the larger equipment is accepted and power-lifting and other woman-saving devices are included. The important thing in sizing equipment is to remove bottlenecks, so that machine operations are keyed to hand-finishing operations, and that the facilities will produce the volumes needed when and as required.

One thing which haunts me as an architect and a consultant is the fear that facilities and equipment so carefully planned will remain unused except at Christmas and Thanksgiving. The dietitian may estimate her maximum needs with a little to spare. She may insist on a bigger kettle, or a larger mixer, or a bake shop or a butcher shop, or food warming units which she is sure will be needed. Six weeks after the kitchen is completed, many items of expensive equipment or building space may be unused for various reasons, such as the economy of purchasing baked goods or prefabricated meats, or the oversizing of multiple cooking units. That is one reason why I humbly ask each dietitian with whom I work to do her best to "try the kitchen for size" by a run-through of her menus and projected kitchen operations before she gives me a list of requirements.

ARRANGEMENT OF EQUIPMENT

Having determined how much of each type of work will be required in the kitchen, the next test is for orderliness of arrangement. Industry uses the term "work flow," a mental comparison of a conveyor belt with a river. I am sure that you have visited canning factories or automobile assembly plants to be fascinated by the pattern created by the rhythm of one operation being done over and over again. Seldom is a kitchen like that unless the production is highly specialized, but certainly there can be planning which puts related things together.

Some factories do all of a given kind of operation in one place, while others do an operation wherever it appears necessary. We might compare the kitchen which has all of its mixing equipment in one area and to which all food is brought for any mixing operation with another kitchen which brings the mixing machine to the food in its preparation cycle, as in the bakery, the steamer section, or the salad department. Each method has its merits, and each can be made to work; the dietitian must know which will be best for her kitchen and write her requirements accordingly.

Generally speaking, a kitchen is considered to be more efficient if there is a linear movement of food from the point of receiving through storage, to rough preparation, daily storage, finishing preparation, and serving, with the waste products of the operation moving from point of origin to point of disposal with a minimum of disturbance and filth and without crisscrossing the flow of clean food products.

To a stranger, some kitchens seem to ask the question, "Where do we begin?" They lack any suggestion of work positions for personnel. The flying platoon is an old football strategy which works in some kitchens, but it often requires a mop-up squad to follow behind it. Departmentalization to the extent of having job descriptions and assignments should cause smoother and less hectic operations. However, this reminds me of a famous hospital having a central tray service and conveyor belts, using a highly selective menu. The girl serving raspberry chiffon cake seemed bored beyond words, but the supervisor assured me that the girl was a new employee in the beginner's spot. Perhaps the other stations were a little more stimulating.

For her own well-being, the dietitian should be sure that the supervisory employees can see what is going on and can supervise as much as possible from one station. The day of highly specialized cubbyholes or rooms in the kitchen seems to have passed, along with the idea that an employee will produce at his maximum capacity without the incentive of a supervisory audience.

Among the aids for supervision are the elevated station for the kitchen supervisor and the intercommunication equipment connected to all work areas. The fixed position television camera connected to a viewing screen on a closed circuit will find use in the near future in larger kitchens where direct viewing is impossible, thus giving the dietitian simultaneous supervision of a dozen remote operations with as many viewing screens on her office wall. Then she will be able to talk and see through the system as she sits in her control "studio," and for her this may mean a profound change in work habits. Our dietitian of the future may do the work that three or four are doing now; she may be able to throw away her soft sole, low heel shoes for fancier footgear, but she may also wear a tighter girdle to keep in shape.

Nothing seems to sell the idea of a new dietary de-

partment to an owner or a board of trustees like the thought of reduced operating costs. Everyone is aware that human labor is expensive if it is used for tasks which an electric motor can do as well or better.

The argument for labor-saving economies is more subtle when it applies to the comfort phases of the dietary department. Good lighting, adequate ventilation or air conditioning, good choice of color, and acoustical treatments all help employee morale and efficiency, and they can be presented to an owner as a practical investment, reversing the traditional attitude that such things are foolish luxuries and that what the customer does not see need not be worth seeing. A kitchen which is attractive and comfortable is a more reliable source of good, appetizing, and profitable food than the damp dark basement with its basket-weave ceiling of pipes and wires, so often assigned to dietary operations.

CLEANING AND MAINTENANCE

While the dietitian is not a sanitarian, she has the daily task of seeing that her department is maintained properly and kept clean. Therefore, her questions about maintenance and sanitation are pertinent. She should know what to expect from both equipment and building materials in their exposure to cleaning operations. I have seen heavy cast iron kettles originally almost an inch thick worn to paper thinness by thorough daily cleaning. Possibly all of you have seen ordinary asphalt tile floors curled up from grease and water damage, or concrete floors pitted from vinegar or fatty acids. When considering sanitary features, the dietitian should insist on the elimination of any unnecessary leg, pipe, or other impediment coming through the floor or hanging from the ceiling. Two tables butted together, each with its own set of legs, leave spaces between supports too narrow for a mop or broom, which become unsanitary and unsightly spots. Ranges jammed together will invite cesspools of grease between their bodies. Equipment poorly fitted against wood or plaster walls will be a source of irritation and filth. When these conditions exist, no amount of stainless steel or chromium plating will offset the obvious lack of total planning for cleanliness and durability.

CHOICE OF MATERIALS

A typical American trait is our willingness to throw away equipment which is not the latest model. In the commercial kitchen we see the opposition of permanence vs. obsolescence; in fact, the food service equipment industry is divided into two distinct camps by this question.

One attitude about equipment is common among tax-supported or endowed institutions. Capital funds are made available for an improvement which includes a kitchen. Taxes which pay for the improvement may continue for thirty or forty years; the improvement should outlast the bond issue!

At the other extreme is the specialty restaurant which is featuring an item suddenly popular with the public; the restaurant has a short-term lease, and experience indicates that public fancies may shift; thus, equipment purchases should be amortized and paid for out of profits as quickly as possible. Consequently, while both the public institution and the specialty restaurant have similar work to perform, they will logically choose much different equipment based on relative costs and durability. Dietitians usually work in operations which vary between these two extremes; they must weigh in their own minds the merits of durability vs. low first cost, choosing heavy or lightweight equipment accordingly.

The dietitian should also be aware of the inherent physical properties of the equipment and building materials in her department. On this subject The National Sanitation Foundation has done a signal service for the dietitian in its bulletins on equipment standards. These clearly bring out the fact that there is a difference between surface coatings and alloys, such as chromium-plated iron compared with stainless steel; painted wood compared with laminated plastic and wood surfaces; soldered joints compared with welded joints; and tough alloys compared with soft materials.

All of these factors have a direct relation to costs. I wish that I could give you a tried and infallible answer to that question, "Are we getting our money's worth?" and a formula for judging the value of an investment in good construction and equipment. We do express an opinion about choices of materials and can present rather formidable arguments both for the purchase of low-cost equipment or for materials costing a great deal. I dislike the words "expensive" or "cheap" because they indicate something different from what I am trying to say. Ruskin once said, "There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are this man's lawful prey."

Where does all this lead us? Certainly, the dietitian has an opportunity as well as an obligation to know her own work well, to express herself clearly and factually, and to work as a member of a team planning with the architect for a dietary department which will function properly. She should stand fast in demanding quality, good materials, and good workmanship if she can demonstrate that such investments will reduce maintenance costs and payrolls. She is expected to produce better and more attractive food, the final test of her planning and cooperation with the architect. She has the right to the tools for her job. If the patrons approve and the employees are happy, efficient, and proud of their jobs and their kitchen, then the dietitian's time, temper, and tears used to get the right size kitchen for the job to be done will have been worth while.

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Management and Organization in Quality Food Production[1]

MARGARET L. MITCHELL

Vice-President—Food Production, The Stouffer Corporation, Cleveland

THE food service industry, which we represent, is *big business*. It ranks fourth among all industries in our nation. Through our "eateries" —whether they be restaurants, hotels, industrial cafeterias, or institutions—pass some seventy-five to eighty million people daily. Some are healthy, some sickly, but *all* are hungry for good, palatable, nutritious foods—whether this hunger is psychologic or physiologic. To serve this many meals a day is a grave responsibility. The health of these people is partly our responsibility, and their dining pleasure for a meal period is wholly our responsibility.

The history of the food service industry is fascinating. As we know it today, it is a comparatively young industry. It has experienced particularly fast growth in the last two decades. We don't have to look back too far in the history of our country to recall the old boarding houses, where food and lodging was offered at a weekly rate; the wayside inns, where travelers stopped to change coach horses and to get food and drink for themselves; or the small hostelries where food and beverages were served. Restaurants, as we see them today, were virtually unknown, and such restaurants as did exist were usually very small and the outgrowth of boarding houses whose reputation for unusually good food and gracious dining had made them famous. Such places were generally a family operation—father being a friendly, genial host with a gift for good conversation and mother, a quiet, hard-working woman with a gift in the art of cooking.

Hospitals in those days were not the institutions they are today, either. Not too long ago, the sick person was more often treated at home than taken to a hospital. A trained nurse was brought into the home, and the doctor made his daily call. Even surgery was performed in the home, and the patient was nursed back to health right in his own surroundings.

The scientific discoveries of the past half century have changed all this; the trend has been toward "group living" and mass production of materials. The individual's desire for economic freedom and a higher standard of living has caused these changes.

Far back in world history, only the ruling classes and the aristocracy could enjoy high standards of living. Good food of great variety and in great quantities was only for the rich—the kings and queens, the emperors, and their associates. The masses of the people lived meagerly on limited quantities of food and could never even hope to enjoy such luxury dining. These kings and emperors hired creative artists for their cooks—and from them, they demanded "food fit for a king." The creative artist in the palace kitchen was equally as important to the king as the great master-painter whom he employed to paint his portrait in the most flattering style.

The palace cook would strive to produce an exctic dish for his master, and he was truly a creative artist. He carried a high regard for his profession, and so proud was he of his "masterpieces" that he would never write down his recipes. Instead, he committed them to memory and passed them along as a legacy from father to son. Each cook guarded his secret art carefully with the hope that he, himself, would gain recognition and fame for his own creations. This kind of pride of workmanship was, in itself, an art.

Many of our present-day popular dishes had their origins in the kitchens of the royal palaces, and the names of some of the items created for kings still live on our menus today. The sandwich, which has popular acceptance everywhere in the United States, is said to have had its origin with the Earl of Sandwich in England. He was such a great hunter that he chose to spend the greater part of his day hunting. He would put slices of meat between buttered bread and eat it while on his way to the stables; consequently, the name "sandwich" was adopted for this food combination. "A la king" is a familiar term today, and such adjectives as "princess" style,

[1] Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 27, 1955.

"supreme," "royale," and so on, are frequently used to imply that a dish has very special taste appeal.

Then came the era of science—and its application to the art of cookery. "Domestic science" was its first official name. The *art* of cooking was giving way to the *science* of cooking. Cooking schools were established, and it became the vogue for young women to study about foods, how to cook them, and their value in healthful diets. Out of these cooking schools grew the home economics courses as we know them today and the studies of dietetics and nutrition at the college level.

Science was applied to the arts in every industry. The desire for progress was the motivating spirit, and America led the world in showing how science could be applied to the arts. Mass production of high-grade materials was the result—and at costs low enough that products were within reach of the average citizen instead of only the aristocrats.

No longer are skilled artists depended on to manufacture their own individual creations; instead, today, the artist creates the first design, and machines reproduce it in quantity. This does not make the artist less important, however. Artists are always needed to make the first design, the first model. Creative art is a fine profession, and such artists have an important part in American industry today, whether they be automobile designing engineers (whose work has been spectacular in recent years), dress designers, architects, designers of fine fabrics and china, or artists in creating new food dishes.

Room for Improvement

The art of cooking is by no means lost. Evidence of this is found in the work of the large food companies and in the home economics kitchens throughout the nation. We cannot open a magazine without seeing some exciting food creation shown in a beautiful picture display. The art of cooking is a fine profession, but today the science of cooking must be coupled with it to meet the challenge of quality operation in quantity production and mass feeding which has come with the changes of our way of life.

Has our food service industry kept pace with other industries in these past fifty years? Have we retained the arts in the handling of foods as we have applied the scientific methods of production? Certainly, many changes have taken place in our industry, and much progress has been made, but I believe we will all agree that needs for improvement are still with us, such as the fact that:

Food is not always served at its peak of palatability—or at its best nutritive quality—in *every* public or institutional eating place.

The most careful practices in food handling are not always followed.

The highest respect for food material is not always shown in our kitchens.

In short, we must question whether these seventy-five to eighty million meals we serve to the public daily meet the high standards of our industry. Let us take stock of our operations with an eye to improvement.

Good management and organization, in my opinion, can be the key to such an improvement plan in this challenge to mass feeding.

What Is the Responsibility of Management?

As I see it, there are three main responsibilities of management:

(a) To serve good quality, nutritious food in pleasant, sanitary surroundings.

(b) To train personnel in their respective work; to offer them progression; and to create for them a pleasant working atmosphere.

(c) To organize the department efficiently, so that these things can be accomplished within a predetermined operating budget.

To fulfill these responsibilities, management must set forth some regulations for itself. It must

- . . . keep an open mind toward change and foster the spirit of progress;
- . . . recognize the responsibility of its institution in the community and train all employees accordingly;
- . . . believe in the importance of serving good food for health and for palatability;
- . . . develop a keen judgment of quality food and continuously strive to improve; and,
- . . . have a good understanding of human engineering and believe in the practice of the Golden Rule.

Progressive Management

Management in today's operation must be progressive. It must continuously look for ways and means to improve and to raise standards within the industry. If management fails in this challenge, it must face the possibility of loss of business and perhaps loss of control of its own department. Sometimes it isn't the knowledge of our work we lack, but rather the *drive* within ourselves to put our knowledge to work and to strive diligently to accomplish results. Obstacles will always be present, and it is sometimes easier to find reasons why a job cannot be done than ways in which it can be accomplished.

The motivating force for improvement in operations within your department must come from *you*. *You* are management within your department. *You* must prepare yourself for this leadership job, not only in knowledge and skills of your work, but in your work attitudes. Keep your thoughts in the positive vein, set values on your time, and keep an improvement chart always before you.

With the following purposes to management—self-analysis, analysis of your system of depart-

mental operations, and training—let us see what the initial step might be to improve the situation.

Self-Analysis

I would recommend, as a first move, a self-analysis—one made by yourself, in your own most critical way. How well do you measure up to these regulations we set forth and how well qualified are you for strong leadership?

Study some of the well known personnel books on leadership, such as *How to Be a Leader* by George Halsey (1), *The Art of Leading* by Ordway Tead (2), and *Employees Are People* by Harry King Tootle (3). The material in these books is extremely stimulating, and, of course, can be very helpful in setting up any self-improvement program.

Then, after you have reviewed yourself and set your attitudes right for good leadership, you can review your system of operations.

Analysis of Operations

Does your system provide a smooth flow of service?

Is your food up to your own high standards of palatability and nutritive quality? Taste-test your food critically. And, may I suggest that you taste it right at the point when it is about to be served. In the hospital, arrange for an extra tray to be sent to a floor for such a taste-test. Tasting in the main kitchen can sometimes give an altogether different picture.

If your food isn't served at the peak of quality, why?

- . . . Is it cooked too far in advance of service and held in steamtables or heating cabinets too long?
- . . . Is it sent to the serving rooms too soon and allowed to cool before serving?
- . . . Do cooks have enough time to do a quality job in producing their dishes?
- . . . Do dietitians' schedules provide for close supervision of food production and service?
- . . . Is regular time provided in schedules for food inspection and tasting?
- . . . Do you have well defined work schedules for each worker, and does each worker know what his job entails?

Analyze your food service system critically. Make whatever changes are needed and revise work schedules so that the maximum in quality food service will be achieved with the most economical use of man-hours of labor. This may take time, but your efforts will be well spent.

Only when you have established an efficient food service system and work schedules to accompany it are you ready to start on the very important job of training.

Training

Training is the basis on which efficiency is built. In the food service industry, training is essential, for our industry ranks *first* in the number of people gainfully employed per dollar volume of business. Our kitchens are not mechanized to the point where human hands and skills are not needed. True, we have many more machines today than we had twenty years ago, but they are simply aids in our quantity production work. Cooking and baking still require the skills of human hands and the pride of human beings.

These workers must be taught the skills of their jobs. They must be taught high standards of food quality and sanitation, and they must be trained in cooperative group working. Training accelerates correct learning, and it gives a worker greater respect for his job and greater pride and satisfaction in his work.

Training begins with, and is directed by *top management*. Food production and service is a detailed business, and management people must never forget that no matter how much they, themselves, may know about the work, they cannot operate the department without loyal employees. The better trained these employees are, the more efficient will be the operation.

Training must be done on two levels: staff training and employee training.

STAFF TRAINING

Staff training comes first. Before effective results can be had in training employees, there must be a meeting of minds among the staff. The existing staff members must set up regularly scheduled staff meetings, at which policies and operating procedures should be determined. The food service system should be fully discussed, all details of the system reviewed, and the employee schedules checked, so that all staff members have a thorough understanding of the organization, how it functions, and what is expected of each unit.

Staff meetings should be regular and continuous. It is only through close cooperation and open discussion at such meetings that problems can be squarely met and solutions found.

When new staff members join the organization, they should be given a short induction training. The operating system should be explained to them, and they should have an opportunity to observe all phases of it in operation. Likewise, the procedures and policies should be explained. Then, their own specific positions can be fully discussed with respect to their responsibilities. The new person should be given a voice in the staff meetings immediately. Even though she is new, she may have some good suggestions.

EMPLOYEE TRAINING

There are three types of employees to be trained: old employees who must learn new procedures and methods pertaining to their jobs; old employees who

have been upgraded to new jobs; and new employees who must be oriented to their new place of work and trained quickly and efficiently. Remember, the very basis of training is *understanding*, and until a person understands what his responsibilities are, he cannot be expected to give a good performance.

The employee must be taught the function of his unit in the whole operation, the mechanics of the job, the work attitude—or what is expected of him as a good employee and the work habits or the regulations of the job. To meet such needs, a training program must be established. Such a program would have four parts: induction training, on-the-job training, group training, and follow-up training.

Induction Training

The first step in organized training is induction or orientation. This simply means introducing the employee to his new job, his company, and to his associates and explaining to him the purpose of his job. This induction training should be done by his immediate supervisor, and this is her opportunity to get acquainted with the new employee and to introduce him to his new job.

On-the-Job Training

On-the-job training is the step in training which involves the supervisor's working at the station right with the new employee, using the teaching principles of telling, showing, repeating, and asking questions to make certain he understands all procedures. It is a method by which practical instruction is given to the employee at his own level.

Group Instruction

Perhaps the most important part of a training program is group instruction, yet it is too often the part which is neglected by supervisors. It is through group class training that an employee is made to feel a part of a working department. It is in group training classes that all general information about the company, its aims, or its projects are related. Here work attitudes and work habits are discussed.

Training classes bring best results when the groups are small, thus making possible group participation in all discussions and demonstrations. These classes should follow a definite program—scheduled times for the meetings set well in advance and the schedule maintained.

A planned lesson program to meet specific needs is necessary. Such a program might include lessons such as:

(a) *Induction Lesson*—to develop pride in the job. Give a short resumé of the history of your institution and its important place in the community. Point out that the reputation of the institution depends largely on employees and how well they do their jobs.

(b) *Cooperation and Organization*. Explain the departmental organization and the importance of close cooperation among all workers to fulfill the work obligations of the department.

(c) *Time and Motion Studies*. Explain what is meant by such studies. Demonstrate the methods of efficient motions to avoid wasted energy and overtiredness. Emphasize the importance of good work plans to save steps. This kind of training, of course, leads to more efficient use of time and greater productivity.

(d) *Equipment*. Describe and name equipment in the department. Demonstrate how to use it properly and how to clean it. Emphasize all safety factors necessary in the handling of the equipment.

(e) *Standard Recipes*. Display your recipe file. Radiate enthusiasm for your recipes and give assurance that you have confidence in them when they are carefully followed. It's often a good idea to bring a product made from a favorite recipe to the meeting for tasting. Emphasize the value of standard recipes in the production of consistently good quality food in quantity amounts.

(f) *Quality Food*. Teach your employees a respect for quality food. Your teaching should show that quality food is the result of skilled workmanship and attention to details. Every cook must be taught to have a keen appreciation for quality food and a pride in producing it. Many demonstrations are necessary to illustrate examples of quality food. Comparative tests are the best means of demonstration that we have found—for example, two or three samples of the same product prepared and judged at one time, i.e., three chocolate cakes made from three different recipes. The whole group can grade the products for eating quality. Such demonstrations will stimulate interest among cooks and at the same time will assist in teaching judgment of quality food.

(g) *Portion Control and Good Service*. Demonstrate the use of serving utensils for portion control. Display your portion charts. Emphasize the importance of attractive plate arrangement and interesting garnishes. Stress the value of fast service, so that food will be at its peak in quality when eaten.

(h) *Sanitation and Good Housekeeping*. In this class, explain your system of housekeeping, and, of course, point up the fact that everyone shares the responsibility of keeping the department clean. Discuss personal hygiene standards in relation to sanitary food handling.

(i) *Review Lesson*. This final lesson should review in general the high-lighted information given in the previous lessons. A question-and-answer period is good, followed by some closing remarks by the instructor to compliment the group and to stimulate close cooperation in working toward improvement goals.

Class instruction accomplishes something in addition to providing knowledge. It fosters unity and provides an opportunity for establishing good

human relations between supervisor and employee. It contributes to a cooperative spirit among workers.

Follow-Up Training

The last phase of our educational program consists of follow-up training. Group classes, once started, should be continued in the form of refresher classes or group meetings. All employees need their spirits kindled periodically, and there is no better way to do this than in refresher classes where an informal atmosphere prevails and good discussion about work can be encouraged.

Periodic meetings within a unit are helpful also; all members of the unit should attend, and meetings should be held for the purpose of discussing problems pertinent to the unit. Such meetings should be kept informal, and group participation, of course, should be encouraged. It is in these group meetings that new ideas can be taught, new improved methods introduced, and standard practices reviewed.

Such an educational program as this will train employees quickly, and it can develop *esprit de corps* that contributes to departmental efficiency. Training is a continuous job—even with old employees—because progress is important if our institution or business is to keep abreast of the times. Only through training can employees be successfully up-graded in their jobs. This is the responsibility of management and the result of organization.

Summary

Management is charged with the responsibility of progression, and progress starts at the top—but must go all the way through the organization. We must keep an open mind to new ideas, and it is our duty to look within our departments critically and to make whatever changes are necessary to show improvements. May I remind you of management's responsibilities:

(a) To serve good quality, nutritious food in pleasant, sanitary surroundings.

(b) To train personnel in their respective work; to offer them progression; and to create for them a pleasant working atmosphere.

(c) To organize the department efficiently, so that these things can be accomplished within a predetermined operating budget.

Management fulfills these responsibilities through careful departmental organization, the most effective tool of which is a well planned training program at these two levels: staff and employee.

The job of food production management is not easy, but it is a constant challenge to the dietitian who enjoys working with quality food, finds satisfaction in developing employees, and is interested in the operation of an efficient kitchen.

Can the food service industry keep pace with other industries in this progressive age? Can we apply science to the art of cookery so that we keep a consistently top quality product flowing from our kitchens to the consumer and do so efficiently? I believe we can, through improved management and good organization.

We are proud of our age of accomplishments in this country. We are proud of our American spirit of progress. The years ahead will bring many more changes in all industries, and our food service industry will continue to play an important part in the building of our nation. Science will continue to give us startling developments. The age of microwave cookery may not be too far distant. It is essential that management keep an open mind and a flexible organization to meet these new ideas and to make its contribution to progress. This is the responsibility of management today.

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Foil Covering for Roasting Not Worth the Effort

Despite the recent trend toward wrapping meat to be roasted in aluminum foil, researchers at the University of Wisconsin Agricultural Experiment Station report that to make the meat look more like roast meat, higher oven temperatures were required, and the foil had to be removed for the last part of the cooking. Flora Hanning and Paul Cleary tested turkey and pork loins, roasted in a variety ofways.

White meat of foil-roasted turkey was rated about the same for tenderness, juiciness, and flavor; the dark meat of the unwrapped turkeys was a little juicier, but not quite as tender. Foil-wrapped turkeys shrank 27 per cent compared to 24 per cent for unwrapped birds. Foil wrapping required a roasting temperature of 400°F., while unwrapped turkey could be roasted at 325°F.

Pork loin cooked unwrapped in an uncovered pan was juicier than comparable wrapped meat, and the flavor was judged poorest for the wrapped loin. Tenderness was judged the same for all samples. Foil-covered loin shrank 24 per cent; a roast that was seared first, then cooked in a covered pan shrank 23 per cent, and the uncovered loin shrank only 20 per cent.

These workers conclude there is no great advantage to using foil during roasting. It is hard to prevent tears in the foil, and at high temperatures it's difficult to remove the foil from hot meat. *From* What's New in Farm Science. *Bull. 512, Wisconsin Agricultural Experiment Station, January 1955.*

Nutrition and Health of Gold Coast Children

I. Food in Four Communities[1, 2]

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Pounding palm nuts for soup

THE present investigation was undertaken to study the diet of children in the Gold Coast, West Africa, in relation to their physical status and the environment. Although some aspects of the health status and general pattern of the diet of these children were known to those interested in the welfare of the country, there had been practically no quantitative study as such, of the diets. Certain aspects of the nutrition and health of children have been publicized by Brock and Autret (1) in a joint report of the Food and Agriculture Organization and the World Health Organization of the United Nations. Williams (2) had reported earlier on the health and general nature of the diet of the children treated at a hospital, later (3) referring to their condition as "kwashiorkor." Russell (4) had described the condition and diet of children treated in the forest country of the Gold Coast.

THE COUNTRY AND COMMUNITIES STUDIED

Relative to the size of many countries in Africa, the Gold Coast is small, having a total area of approximately 92,000 sq. mi. Despite this small size, however, there are three distinct geographical zones: a coastal plain, a tropical rain forest, and a northern savannah land. The country is warm throughout the year with an annual mean shade temperature ranging from 85° to 93°F. Annual rainfall is approximately 33 in. in the coastal zone and 61 in. in the forest zone. In general, the rains come in two distinct seasons.

The advanced political status and the extensive production of cocoa and mining products in the Gold Coast make the country outstanding in West Africa. However, some 88 to 90 per cent of the population is still nonliterate, while food farming, the occupation of about half of the population, is still done by aboriginal methods.

The main portion of this study was carried out in Ayeduase, a village of 415 people in the forest zone near the city of Kumasi. There were 42 households in the village, with an average of 9.9 persons. Some of the men are absentee owners of cocoa farms, a few are laborers, and others are unemployed. The women are farmers, producing food for home consumption and for sale. The nearest medical services are in Kumasi, some 5 mi. distant. At the time of study, contact with Europeans had been almost negligible. Despite some differences in economic levels, all of these people live in the traditional

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[1] Work done in partial fulfillment of the requirements for the degree of Doctor of Philosophy in nutrition in the field of home economics, Division of the Biological Sciences, University of Chicago. Received for publication August 17, 1954.

[2] The decision to carry out this study resulted from association in the Department of Anthropology, Northwestern University. The Department of Home Economics, University of Chicago participated in the plan and provided equipment. In the Gold Coast, the study was sponsored by the Department of Chemistry, University College, Achimota, and Kumasi College of Technology aided in terms of housing and initial arrangements. Health examinations were obtained through the courtesy of physicians of the Gold Coast Department of Medicine and of a physician in private practice.

[3] The author wishes to acknowledge the help of Dr. Thelma Porter, University of Chicago, and of Dr. Melville J. Herskovits, Northwestern University; the part of David Balme, Principal, Dr. K. A. Busia, and Dr. J. Graham, University College of the Gold Coast in making the study possible; the assistance of E. Sproat, Elsie McQuire, Lord Hemingford, Dr. J. P. Andrews, Robert Pattison, and A. M. Opoku at Kumasi College of Technology; the courtesies of Dr. Margaret Gamble, Gold Coast Department of Medicine; the help with local foods of Janet Asare, Achimota School; the aid with fish of the area of Rowena Jackson, former lecturer, University College; the suggestions of Marjorie duSautoy, former Nutrition Officer, Gold Coast Department of Medicine; the help of the Gold Coast Departments of Agriculture and Social Welfare; the assistance of Margaret Grant and Dr. B. S. Platt, both of the London School of Hygiene and Tropical Medicine, and of Drs. Charlotte Chatfield and M. Autret, Food and Agriculture Organization of the United Nations, Rome; and the courtesies of the Colonial Office and of the International African Institute, London.

pattern of the Ashanti of the area. Cooking is done on hearths on the floors of courtyards, and water is obtained principally from an open pool in the forest. Public pit latrines stand on the edge of the village. Malaria and other parasitic diseases are endemic, as in other parts of the country. A primary school was opened in the village about sixteen years ago.

Dome, a second site of study, is on the coast 8 mi. from Accra, the capital of the country. The population was just over 200. Thirty-six households were identified, with an average of 5.7 persons each. It is a heterogeneous village of migrant laborers from at least four ethnic groups. The women raise a small amount of food on land surrounding the village, and some peddle herbs or firewood. The pattern of living is similar to that in Ayeduase, though there are differences. Many obtain drinking water from steam engines that stop in a near-by railway station. Most of these people have had some contact with Europeans. Medical services are available to those who seek them at nearby Achimota School Clinic. There is a small primary school in the village.

Mampong, Akwapim, where limited study was carried out, was said to have a population of about 3700. It is on the edge of the forest country and close to the coastal zone. The number and size of all households was not learned. There was an average of 11.7 persons in the three homes studied. Adults in two of these were farmers, while the head of the third was employed as a driver. Medical services are provided by the Ampofu Clinic, whose head, a native of the village, understands the needs.

One large household was studied in Accra, the principal city on the coast. A household of moderately well-to-do adults with some formal education was chosen as a contrast for the nonliterate village families. Although the traditional pattern of living has not been abandoned by this group, some European customs have been adopted. Mosquito netting was used, and the younger children received a malaria prophylactic during the rainy seasons. Sewage disposal improved the sanitation. In contrast with the villages, life was lavish; even in terms of western standards, it was comfortable.

A group of village women were interrogated in the small farming village of Mpamfukrom, in the coastal zone. The site of this village had recently been moved from inaccessible bush to a new location on a road. This was a project sponsored by the Gold Coast Department of Social Welfare and Community Development and carried out jointly by a Mass Education Unit and the villagers themselves. The main objective of the move was to provide better market facilities for the farm products, but various facets of village life were undergoing change as a part of the project.[4]

SUBJECTS AND SCOPE OF THE STUDY

Sixty children whose ages ranged from under one to sixteen years served as subjects for the main part of the study. Twenty-three lived in Ayeduase, 16 in Dome, 12 in Mampong, and 9 in Accra. In addition, information was obtained concerning the diets of 36 school children in Dome.

Clinical and laboratory examinations were obtained for 45 of the children in the households and for 59 school children in Dome (including 11 from the four households there). Clinical data were also obtained for 16 children who were patients at the clinic in Mampong.

Sixty-eight village mothers were interviewed concerning matters pertaining to the welfare of children. Approximately thirty women were also interviewed as a group during a course in child care given in Mpamfukrom.

As an aid in calculating the nutritive value of the diets, analyses of the proximate composition (moisture, ash, fat, protein, and carbohydrate) were made of a number of foods. The following were the most important: fermented corn dough; fermented corn dough balls (*kenkey*); edible portions of two species of smoked herrings (*antebo* and *krankranma*); smoked cat fish (*adwena*); a small perch-like fish sold in the markets after frying (*didee*); and imported salt fish (*bagaya*). Calcium determinations were carried out on the above foods plus: raw and cooked cassava (*bankyi*), a mixture of cooked cssava and plantain (*oborode*), raw and cooked coco-yam leaf (*kontomle*), and on cooked foods representing the usual diet of one child. Ascorbic acid was determined in cassava and plantain —raw, cooked, and after pounding to the state known as *fufu*.

METHODS EMPLOYED

All field study was made with the help of an interpreter. Initial arrangements in the villages were made through the chief and his advisors (as in Ayeduase) and through others holding positions of trust and authority.[5] Choice of the families in Ayeduase was left to the chief with the request that the groups chosen represent different economic levels if possible. All children in four households were included. In Dome, four households were chosen at random with help from the school master, and all children present were included. The households in Mampong were selected through the clinic. Only children reputedly up to and including eight years of age were included from three households there.

General information concerning the environment was obtained before leaving the United States and during ten months' residence in the country. Quantitative dietary data were collected during periods lasting from three to ten days for each household. In the heart of the forest, where food supplies are almost entirely home grown, the ten-day study in each group was divided

[4] The writer is indebted to R. Prosser and K. Pickering, Gold Coast Department of Social Welfare, for the interview in Mpamfukrom.

[5] The writer is indebted to Rev. Noel Duckworth, University College; Dr. Michael Wilson, Achimota Clinic; and Dr. O. Ampofu, Mampong, for many of these arrangements.

according to seasons. Edible portions of food provided for the children, or portions in which they were to share, were weighed before and after cooking. Nutritive values were obtained by applying values from various sources, including Platt (5); Nicholls (6); Leung, Pecot, and Watt (7); and Watt and Merrill (8). Values determined in the laboratory were used also. The data were considered in terms of averages per child per day.

Laboratory work was started at University College of the Gold Coast and completed at the University of Chicago. Cured fish and corn meal products were sent to the United States by air, after being securely wrapped in aluminium foil and boxed. Methods of the Association of Official Agricultural Chemists (9) were followed almost entirely. The nitrogen determinations carried out in the United States were by the semi-micro method described by Cole and Parks (10).

FOOD—ITS PREPARATION AND SERVICE

With the exception of meat, the country largely produces its food. Outside of the northern savannah zone, livestock farming is not extensive because of the tsetse fly. In 1951 the total supply of meat was about 10 lb. (4.6 kg.) per year (11). Except for an occasional chicken or turkey, livestock was not kept in the two main villages of study. Villagers supplement the small amount of meat they purchase with bush meat and land snails. However, due to some deforestation, wild life is said to be less plentiful than formerly. Neither poultry nor eggs are regular items of the village diets. The eggs produced are sold for consumption by Europeans and a few Africans who have modified their traditional eating habits. Eggs also are used for ceremonial occasions.

Smoked fish is the most important source of animal protein. A recent estimate by Jackson (12) places the annual production of fish at about 60,000 tons and the supply per person per year at about 40 lb. (18 kg.). Distribution is, of course, unequal and in estimating the amount consumed, refuse must be considered.

Mass of pounded tubers, known as *fufu*

Climatic conditions of the forest villages are favorable for a large number of crops, including coco-yams, cassava, yams, and plantain.[6] Various legumes are grown in forest clearings. Lima beans appear to be the most common. Groundnuts (peanuts) are raised in the forest, but in general, there is too much shade and moisture for optimal crops. Garden eggs (small egg plants), peppers, onions, and a few tomatoes are the principal succulent vegetables raised, although the leaf of the coco-yam (*kontomle*) is used as a green. Palm trees are common and the nuts are important in the diet. Fruits are available during two seasons, but the women sell much of the fruit and a large portion of the onions and tomatoes as well. Some of these sales, of course, are justified as there is no method of preserving fruit and succulent vegetables.

Cassava and corn are the most important staple foods of the coastal zone. Small garden vegetables include those of the forest zone plus okra. Groundnuts are raised, and fruits are available as in the forest. Palm nuts are somewhat more plentiful on the coast than in Ayeduase, while they are abundant in Mampong, the heart of the palm tree area.

Though the village diets lack variety, there is no shortage of food in either the coastal and forest zone at any time of the year. Of the tubers used in the forest, only the supply of yams does not last throughout the year. Palm nuts were less plentiful in Ayeduase in the dry season, but even then there were nuts at the tops of the trees. The supply of garden vegetables fluctuates, but planting during different months appears to offset an absolute lack.

Food preparation was much the same in each community. Fresh tubers and plantain are prepared by boiling them either together or alone. At least once each day, these boiled foods are prepared further by pounding to the doughy mass known as *fufu*. Plantain often is eaten after frying. Boiled tubers and plantain are served plain or with a few teaspoons of vegetable stew. *Fufu* is always served with thin soup or stew.

All small vegetables, palm nut extract, groundnuts, and flesh foods are prepared as soup or stew. A very small amount of salt fish is often used in addition to other flesh food, or in place of it, for flavor. In preparing these dishes, the vegetables are cooked until soft and then drained and pounded to a paste before addition to the soup. Seeds and skin are discarded. Where soluble nutrients are concerned, the method appears wasteful, but it has arisen empirically, because some local leaves and tubers contain toxic compounds. The palm nuts included in soups are boiled, and the oil extracted by a long process of washing with warm water and squeezing and straining. Only the red oil from the pericarp is used, which is desirable from the standpoint of carotene. When groundnuts rather than palm nuts provide the basis of the soup, the raw nuts are

[6] The most common coco-yam (*Xanthosoma saggitifolium*) is known in other parts of the world as "tannia." The tubers (or corms) were usually white or cream colored, and they are not unlike potato when boiled. The yam (which is largely *Dioscorea cayanensis*) is a very large tuber whose most desirable variety is also somewhat like the white potato.

first toasted lightly to remove the skins and then pounded to a paste before adding to the soup. In the forest zone, the heads of the fish are usually retained during the cooking. Then, in eating, the edible part is sucked out and the bony part chewed before it is discarded. Very small fish are cooked whole and consumed in this state.

In addition to fresh cassava tubers, cassava flour (*kokonte*) and meal (*gari*) are used extensively on the coast, and to some extent in some forest villages. Fermented corn dough products are very important in the coastal diet. The preparation of the corn dough is noteworthy, as it is the starting point for many dishes. The housewife may purchase the prepared dough from a stand or market and proceed with the later steps, or she may start with the grain. She may even purchase the most popular dishes, such as the boiled dough balls (*kenkey*) and the strained porridge (*akasa*), ready-to-eat. In any case, the initial preparation starts with the soaking of the dry grain. After about 24 hr., it is ground in a simple mill that does not bolt the meal (though in some communities the hull is removed after preliminary soaking). After grinding, the meal is mixed with enough water to form a stiff dough. It is then covered and allowed to ferment for two or three days, depending on preference. Final preparation then is carried out. From observations and a number of determinations, it seems that the standard for *kenkey* (dough balls) is well established and that variation in the concentration of the meal is not great.

In the villages studied, two or more adults ate from the same vessel. Two or more children usually shared food. Where the group was large, several often ate from the same vessel. One Fanti mother, wife of an Ashanti, who generally served food to her child in a separate vessel, and the younger children in the moderately well-to-do home in Accra were provided with separate bowls. Several children occasionally ate from separate vessels. Eating is done with the fingers, but even the children are deft and in no way untidy.

Children in Ayeduase eating from one vessel

Most adults eat two meals a day, but in some homes where there was more than one wife or more than one responsible woman, food might be prepared for the head of the household three times a day. As a rule, all members of a household come together only for the evening meal. A fixed pattern was not observed for feeding preschool children in Ayeduase.

Children of school age in the first and second households ate cooked tubers or plantain at home before school or were given pennies to buy these foods from a stand. Often they boiled these foods themselves. Children of school age in the second home did not have food before school, nor did the girl of seven in the fourth household, unless she boiled tubers for herself. All school children ate at noon, but this meal as a rule consisted only of boiled plantain, coco-yam, or cassava, with a spoonful of stew or soup flavored with a small piece of fish. The main meal for the entire family was served shortly before sunset. Meal patterns were similar in the other villages, although distribution of food provided for children during the day was better in Dome. The children in Accra received three substantial meals daily.

TOTAL FOOD CONSUMPTION

Total food prepared in the households during one day seldom represented the total consumed by the group. In Ayeduase, adults were dispersed during the day, and in two households cooked food was sent in by wives in other houses or sent out to a husband staying in the home of relatives. In Dome, the men ate only the main meal at home.

In four households in Ayeduase from 5,000 to 15,000 gm. raw edible tubers and plantain represented the total prepared (or reaching the households) per day. Total edible fish and meat ranged from 115 to 800 gm. per day. In addition, Lima beans, garden eggs, and peppers were used daily, and coco-yam leaf frequently, except in the very dry season. The oily extract of from 500 to about 800 g.m palm nuts was used weekly and about 200 gm. fresh groundnuts fortnightly.

On the days when the meals of the adults in the four households in Ayeduase could be accounted for, it was apparent that the average consumption of tubers and plantain per adult per day ranged from 1,200 to 1,600 gm. That of flesh food ranged from 55 to 75 gm. In addition, each adult consumed as an average from 15 to 30 gm. Lima beans, 40 to 50 gm. other vegetables, and from 5 to 12 gm. oil. The amount of the foods varied little per adult per meal, differences in

consumption coming from an occasional difference in the number of meals. However, this was taken to reflect organization rather than supply. Approximately one-fourth more flesh food was provided per person in the more prosperous group. Palm wine is used in Ayeduase, but it was not taken in any of the households studied during periods of study. Its use was said to be reserved for ceremonial days and for holidays. The more prosperous buy other alcoholic beverages for holidays and celebrations also.

As a result of a door-to-door survey, it was learned that an average of 2s.11d (about 41 cents) was spent per Ayeduase family per day for flesh foods. At the prices in the village in 1952, this would purchase approximately 1 lb. cured fish or about ⅔ lb. cured fish plus 2 oz. beef (a distribution recorded). As children under six years of age ate only very small amounts of flesh food, there would have been an average supply for persons of other ages of about 60 gm. per day. Refuse would have decreased the amount consumed, but this would have been offset by an occasional catch of game meat.[7]

In Dome, the food consumption of two women in one home was studied during three days with the following findings in terms of the average, raw edible portions per woman per day: 1,200 gm. fresh cassava, 150 gm. corn dough, 75 gm. cassava meal, 75 gm. succulent vegetables, 20 gm. cured fish, 40 gm. red palm oil, 5 gm. coconut oil, and 5 gm. sugar. Such a diet would provide approximately 2,600 calories and 31 gm. protein (13 of which would come from the dry fish). In terms of calories, this was a more generous diet than that estimated for the adults in Ayeduase, but the protein content was somewhat less. However, a survey carried out by Jackson (12) during the same year suggests that the purchase of flesh food in Dome was probably greater as an average than that discussed for Ayeduase.

[7] Said to be about one small antelope per month in the homes studied.

In Mampong, the average consumption (in terms of raw edible portions per day) by two women was found to be: 750 gm. fresh cassava, 65 gm. wheat flour, 18 gm. coco-yams, 50 gm. succulent vegetables, 34 gm. cured fish, 52 gm. red palm oil, and 18 gm. sugar. The caloric value of such food would be about 1,700 and the protein content 38 gm. The diet illustrates the greater use of palm oil in Mampong as compared with Ayeduase and the use of some flour and sugar. Supply accounted for the difference in palm oil. The use of flour and sugar undoubtedly reflects the longer contact which these people had had with Europeans.

Children of moderately well-to-do household in Accra eating from individual bowls

FOODS FOR THE CHILDREN

Ayeduase. As may be seen from Table 1, large quantities of tubers and plantain were provided for children in Ayeduase. However, the diet for the first group was more generous with respect to these and to most other foods as well. In the fourth group, where the children ranged in age from two to seven years, there was a total of 343 gm. tubers and plantain per child per day, and 11 gm. flesh foods. In the first home, where the children ranged in age from six to twelve years, there were 832 gm. of the tubers and plantain and 49 gm. flesh. The average amounts provided in the second and third households fell somewhat between the two extremes. However, the age range for these groups was wider, so that the actual diets of the individual children probably varied considerably from the averages. Half of the children in the second household were between the ages of two and six years, and the other half were between eight and fourteen years. Those in the third home were adolescents, with the exception of one child of two years.

The few individual data obtained provided some information concerning the variation in intake. During a three-day study, a boy of twelve years in the first household received 150 gm. more tubers

TABLE 1

Average weight of raw edible food provided per child per day in each household studied

FOOD	AVERAGE WEIGHT OF FOOD PROVIDED PER CHILD							
	Ayeduase				Dome	Mampong	Accra (well-to-do household)	Nursing children from two groups
	Household 1	Household 2	Household 3	Household 4				
	gm./day	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*
Plantain	370	282	141	73	37	23	95	6
Coco-yam	232	170	370	230	0	160	0	10
Cassava	178	179	166	41	220	178	189	10
Yam	52	28	76	0	0	0	0	0
Rice, unmilled	4	6	3	0	0	0	34	0
Cassava flour and meal	0	0	6	0	127	0	33	11
Corn dough (moisture 45%)	0	4	0	0	140	31	499	31
Wheat flour, unenriched	0.5	0.5	3	0	0.5	10	7	0
Lima beans	18	13	11	3	0	0	17	0
Groundnuts (peanuts)	0.5	0.5	3	2	0	0	8	0
Garden eggs (egg plant)	15	6	12	1	5	2	0	0
Coco-yam leaf	13	23	17	13	0	0	0	0
Peppers, red and green	7	5	4	2	3	3	1	1
Tomatoes	2	0.5	0	0	8	20	6	0.5
Onions	1	0.5	0.5	0.5	4	5	2	1.5
Okra	0	0	0	0	9	0	0	0
Oranges	10	4	15	0	0	0	4	0
Pawpaw (papaya)	0	10	0	0	0	0	0.5	0
Bananas	0	0	8	0	0	0	12	0
Mangoes	0	0	0	0	0	0	5	0
Avocado pears	0	0	0	0	0	0	5	0
Smoked fish (moisture 16%)	32	17	10	2	5	12	6	2
Salt fish (moisture 24%)	1	0.5	1	1	4	0.5	2	0
Fresh fish*	0	0	0	0	19	0	40	0
Meat, lean†	12	4	15	6	4	3	4	0
Pork, lean	0	0	3	0	0	0	0	0
Pigs feet	0	0	0.5	0	0	0	6	0
Cow skin	0	0	0	0	0	0	11	0
Snails	2	0.5	0	0	2	0.5	0	0
Crabs	0	2	0	0	0	0	2	0
Prawns	0	0	0	0	0	0	4	0
Sardines	2	0	0	0	0	0	0	0
Red palm oil	3	3	3	1	10	13	21	1
Coconut oil	0	0	0	0	3	0	0	1
Lamb fat	0	0	0	0	0	1	0	0
Butter	0	0	0	0	0	0	0.5	0
Coconut, fresh	0	4	0	0	0	0	0	0
Sugar	3	0.5	1	0	5	8	15	4
Milk, evaporated	0	0	0	0	0	10	3	0

* Includes the small fish, *didee*, consumed whole, as well as other varieties.

† Includes beef, mutton, and antelope.

and plantain per day than the average, also 25 gm. more rice, and 11 gm. more flesh food. During one period of study, a two-year-old in the second household often insisted on eating from a separate bowl. As a result, it was apparent that he consumed from 300 to 350 gm. tubers and plantain (in contrast with 659 gm. for the average) and about 12 gm. flesh food each day. The actual amount of food taken from communal vessels by a child of two in the third home often seemed to be similar to that of the former child. A boy of fourteen in this group ate essentially the average amount of fresh tubers and plantain (753 gm.) but three times the cassava flour, and 20 gm. more fish and meat per day. Little in-

TABLE 2

*Constituents determined in the edible portions of fish and corn meal balls**

FOOD	NUMBER OF SAMPLES	MOISTURE	ASH	PROTEIN	FAT	CARBOHYDRATE BY DIFFERENCE	CALCIUM
		gm./100 gm.	*gm./100 gm.*	*gm./100 gm.*	*gm./100 gm.*	*gm./100 gm.*	*gm./100 gm.*
Herring, smoked (*antebo* and *krankrama*)†	5	16.3	6.9	72.6	4.6	—	0.80
Cat fish, smoked (*adwena*)	2	14.7	5.3	74.0	5.1	—	0.53
Salt fish, imported (*bagaya*)‡	1–3	24.5	24.6	49.0	3.0	—	0.34
Perch, fried whole (*didee*)¶	5–10	11.0	15.7	49.2	23.1	—	4.40
Corn meal balls (*kenkey*)	3–5	55.0	0.7	4.4	2.0	37.9	0.005

* Edible portions of first three samples of fish included small bone softened by curing, so that it appears to be eaten.

† Includes *S. cameronensis* and *S. aurita*.

‡ Total ash includes salt used for curing.

¶ Said to be a Cichlid. The weights ranged from 3 to 7 gm. each.

dividual data were obtained in the fourth household. As will be discussed later, the children there were ill. The women, too, were in poor health and engrossed with pregnancies as well. It was impossible to ask for the special favors in the way of extra weighings of individual servings as in the other homes, where these were granted willingly when possible.

Dome. Corn dough products replaced a portion of the fresh tubers and plantain used in Ayeduase, and dried cassava products replaced some of these foods also. Legumes were not used at all, nor were fruits. There was also an average of 19 gm. fresh fish (bought ready-to-eat at a stand) in contrast to Ayeduase, and four times the oil. The diet of a child of three and a half was weighed separately and found to provide an average of 150 gm. fresh cassava, 150 gm. corn dough, 15 gm. cured fish, 11 gm. vegetables, 4 gm. oil, and 3 gm. sugar. The majority of the children consuming the food shown as an average for this group were between the ages of six and twelve years. Aside from slight differences in flesh foods and fat, this average diet probably represented the average diet for most children of these ages in the village. This was borne out from the results of weighing the noon meal of school children and of subsequent inquiries in their homes.

Mampong. The food provided for children between the ages of two and eight years in Mampong is given in Table 1. This diet did not differ significantly in the types of food used in the other villages, but the amount of oil was four times as much in Ayeduase. The milk was consumed by one child, as the result of advice from the clinic.

Moderately Well-to-Do Home in Accra. The diet in Accra differed from the village diets in the larger quantities, in the greater variety of flesh foods, and in the greater use of fruit, but the preparation of the foods was the same. Distribution seemed appropriate to the ages.

Nursing Children. Boiled tubers and plantain shown in Table 1 were given as supplements for children from nine months to two years of age. Corn dough and cassava meal were served as gruel.

TABLE 3

Calcium and ascorbic acid in certain Gold Coast foods

FOOD	NUMBER OF SAMPLES	ASCORBIC ACID	CALCIUM
		mg./100 gm.	*mg./100 gm.*
Cassava, sweet*	1–3		
Raw		40.0	23.9
Boiled		23.0	18.6
Fufu		18.2	17.4
Cassava, bitter	1–3		
Raw		31.6	—
Boiled		20.1	—
Fufu		13.3	—
Plantain	1–2		
Raw		12.8	—
Boiled		9.4	—
Fried		6.5	—
Plantain and cassava (*fufu*)†	2	12.2	14.5
Coco-yam leaves‡	2		
Raw		—	107.0
Boiled		—	85.6

* Sweet and bitter cassava differ in the content of hydrocyanic acid.

† Samples prepared by an African woman in village and said to contain about $\frac{1}{3}$ cassava and $\frac{2}{3}$ plantain.

‡ *Xanthosoma saggitifolium* only.

Cost or Value of the Diets. The value of the average amount of food provided per child per day in the four households studied, in Ayeduase was estimated to range from 10d. ((11½ cents) in the first household to 4d. (almost 5 cents) in the fourth; that in Dome was nearly 8d. (almost 9 cents). The cost of the average amount of food provided in the Accra household was 1s.5d. (almost 20 cents). At present, the value of the food probably would be from 10 to 15 per cent higher than in 1952, as prices have increased at least that much.

LABORATORY DETERMINATIONS

The results of the principal laboratory determinations are given

TABLE 4

Nutritive value of the average weight of raw edible food provided per child per day

GROUP	CALORIES	PROTEIN		FAT	CARBOHYDRATE	CALCIUM	IRON	VITAMIN A	THIAMINE	RIBOFLAVIN	NIACIN	ASCORBIC ACID
		Animal	Total									
	gm./day	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*gm./day*	*I.U./day*	*mg./day*	*mg./day*	*mg./day*	*mg./day*
Ayeduase*												
Household 1	1,164	26	41	8	232	400	10	4,862	0.70	0.84	8	142
Household 2	932	13	25	7	190	260	7	5,367	0.51	0.64	6	126
Household 3	1,049	11	27	9	215	270	9	4,021	0.80	0.63	8	92
Household 4	432	4	11	4	88	124	4	2,592	0.41	0.25	4	39
Dome†	1,264	11	23	20	248	481	10	5,305	0.42	0.48	5	83
Mampong‡	761	9	18	17	134	181	5	7,122	0.37	0.41	4	76
Accra (well-to-do household)¶	2,154	17	52	48	379	336	13	11,512	1.48	0.77	12	87
Nursing children§	175	2	4	3	33	24	1	583	0.09	0.05	0.5	6

* Ages were: Household 1, 6 to 12 years; Household 2, 2 to 15 years; Household 3, 2 to 15 years; and Household 4, 2 to 7 years.

† Ages were: 3½ to 13 years.

‡ Ages were: 2 to 8 years.

¶ Ages were: 6 to 16 years.

§ Ages were: 9 months to 2 years.

in Tables 2 and 3. Smoked fish was found to be a concentrated source of protein, and, because small bone was included as edible, a very good source of calcium. The small fish eaten whole is also an excellent source of calcium. Fat was low in the smoked fish, a percentage of the fat, of course, being lost with the removal of the dry skin. The fat content of fish from tropical waters is reputedly lower than for fish from waters of the temperate zone. After the dry, cured fish had been cooked, as for soup, the average moisture of five samples of four species was 57 per cent. Refuse (weighing nearly 1 oz.) of smoked herring and cat fish averaged approximately 43 per cent, when skin, scales, larger bone, appendages, and intestines were discarded.

Corn meal derived from the basic dough or from the *kenkey* balls gave values for proximate composition and calcium similar to those for whole, unbolted meal (8). The following represent the percentage composition on the moisture-free basis: ash, 1.56; protein, 9.8; fat, 4.4; and carbohydrate-by-difference, 84.2. The percentage composition of *kenkey* may be seen in Table 2. Average moisture of the dough stage was 45 per cent.

Cassava and plantain retained significant amounts of ascorbic acid after boiling and pounding. From 78 to 80 per cent of the calcium was retained after cassava and coco-yam leaf had been boiled in water to cover. A retention of this much of the original calcium was suggested by finding that the calcium content of food consumed by a child was 21 per cent lower than the value calculated for the raw food. Oxalic acid was not determined. Dalziel (13) does not mention oxalic acid in discussing plants of West Africa.

About 15 per cent of the palm nut appeared to be extracted for soup and stew. The fat content of two samples of soup prepared by traditional method by the writer and her assistant was 11.8 per cent. That prepared by a coastal woman was 9 per cent. From the reduction in the volume of the soup on which the first two determinations were made and the increase in the weight of the warm water used for extracting the nuts, it is apparent that a portion of the fibrous pericarp was extracted as well as oil, for otherwise the fat content would have been higher. A value of 10 per cent oil was assumed for soup unless both the weight of the nuts and the weight of the cooked soup varied greatly from the usual. As a rule the greater fat content of some diets resulted from larger servings of soup than from a greater concentration of oil per serving.

NUTRITIVE VALUE OF THE DIETS

The average nutritive value for each child in each group provided by the food available is given in Table 4. Formal comparisons with requirements and allowances for individual children or groups in other parts of the world have not been included. However, the nutritive values have been considered in terms of the National Research Council's allowances (14). A composite "allowance" was calculated for each group by taking an average of those given for each age represented. The caloric allowance for each age group was corrected for the temperatures (25.6°C. for the coastal zone and 27°C. for the forest), as recommended by FAO (15).

The difference between the caloric value of the average amount of food provided for each group of village children and the average requirement of each group was large. In Ayeduase, this ranged from 768 to 1,065 calories; it was approximately 700 in Dome and Mampong. The caloric allowances of the group in Accra were met.

When the nutrients shown in Table 4 were considered for each village group in terms of the composite for each group, only vitamin A values, ascorbic acid, and iron of the diets compared favorably. The food of the Accra group provided most of the nutrients in relatively generous amounts, except for calcium and riboflavin.

Supplementary foods for the nursing children added but few nutrients. The nutritive intake and

milk production of the mothers is not known. According to Brock and Autret (1), Platt found the milk production of mothers in the Gambia to be about 1 pt. per 24 hr. when the babies were from twelve to eighteen months old. Assuming a similar production by the mothers whose babies were from one and a half to two years of age, the children may have lacked about 500 calories.

DISCUSSION

Even though the protein in the village diets was less than that considered desirable, it is noteworthy that in Ayeduase from 36 to 63 per cent of the totals were derived from animal sources. This resulted from the high concentration of protein in the cured fish.

Children may have obtained additional calcium from chewing the bony heads of fish and other large bone. Turbid drinking water in Ayeduase may have provided calcium also. Finally, it should be emphasized that both the source of much of the calcium and the environment favor the utilization of calcium. Leverton (16) has shown that Filipino girls utilize the calcium in bones from small fish as well as from milk. Then, too, young children are without clothing for much of the time, and older children frequently are naked to the waist during a part of the day, thus synthesis of vitamin D and good calcium utilization are favored.

The extremely low fat content of the diets in Ayeduase resulted from the infrequent use of palm nut soup (about weekly) and the smallness of the servings. With all meat being very lean and the fat content of cured fish low, there was no good potential source of fat except the nuts.

SUMMARY

A short background of a dietary study carried out in the Gold Coast has been given. The diet of children in four communities in two zones of the country has been described.

There was little variety in the diet, with foods high in starch content predominating. With the exception of a moderately well-to-do group, the diets appeared to be poor or inadequate to the extreme in terms of usual western concepts. Health findings, reported in the following paper, help to emphasize particular weaknesses of the diets.

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Automation in the Food Field?

Science Digest in February 1955 reports that before long it may be possible to make a cake using a magnetic tape recorder-playback machine to measure, combine, and mix the ingredients in proper amounts and sequence. A demonstration apparatus capable of automatically performing a series of mechanical tasks with speed, efficiency, and accuracy, has already been developed.

The recorder-playback machine was connected by wiring to electronic relays controlling glass tubes housing the various ingredients of the cake and also to an ordinary household electric mixer. Above on a large control board, were indicators for regulating the amount of each ingredient to be used and a corresponding series of lights that showed which phase of the process was in progress.

The operator selects the quantities of flour, eggs, baking powder, and other ingredients, using the control-board pointers, and then starts the machine recording. When all information had been taken down, the operator switches the instrument to "rewind" and plays back the tape, which in turn activates the various relays in correct sequence and amount. The ingredients are automatically poured into the mixing bowl and the mixer turned on. When thoroughly blended, the mixer is shut off and the cake is ready for the oven. The recording and playback phases requires about 90 seconds each, the entire operation only about 30 min.

Six-month-old, apparently healthy baby in Ayeduase. Physical examination, however, indicated anemia and an enlarged spleen. Development was classified as "good." However, after this examination was made and the photograph taken, the child waned, and in the seven months between surveys gained only 0.4 kg. in weight.

Nutrition and Health of Gold Coast Children

II. Care and Physical Status of Children[1]

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FOOD provided for sixty children in four communities in the Gold Coast during from three to ten days of quantitative study has been reported and the nutritive value of this food has been discussed (1). The general pattern of the adult diet has been described, and the results of certain laboratory analyses carried out on the local foods have been given (1). The present paper is concerned with the practices of mothers in the traditional villages and with the physical findings for the children in these communities as well as for the children in a moderately well-to-do family in Accra, the coastal capital city of the Gold Coast.

With the exception of the Colony proper (southern part of the country), mortality records concerning mothers and infants of the country as a whole were not available at the time this study was done. Although in comparison with many parts of tropical Africa, the Gold Coast is advanced in terms of economic, political, and social development and, as a result, some change has come to the villages of the country (where the bulk of the population is found); the basic pattern of traditional living has been modified only for some. In a society such as this, there are many superstitions concerning birth and death that tend to inhibit free discussion of these matters. Also, because few are literate, accurate records have not been kept.

According to Platt's report of 1947 (2), infant mortality for the Colony proper was 129 per 1000 births, with maternal mortality 16 per 1000 births. Since that time medical services have increased so that these figures have doubtless been decreased. Inquiries made in the forest village of Ayeduase, site of a main portion of this study, disclosed that two children under one year of age and four older children had died during the previous year. At the time of study there were 30 children under one year of age and 128 from one to twelve years old. Assuming that the physical findings for the 23 children studied in Ayeduase are representative, the number of deaths appears small. As will be discussed later, the death of one of the subjects occurred during the last period of study.

In Dome, the coastal village studied, the death of one child between the age of one and six years was reported for the previous year. At the time of study, there were seven children under one year of age in this village and sixty-seven between the ages of one and twelve years.

Specific information on the adult population is also difficult to obtain. Few know their exact age; thus, the average age of the first pregnancy cannot be learned. In the villages studied, the appearance of young mothers suggested that they were between sixteen and twenty years old. In former times, when polygamy was said to have been more common, there appeared to have been a wider interval between pregnancies. Women went to the homes of their mothers soon after the beginning of pregnancy and remained until the child was two or more years of age. The custom of returning to mother's home is still practiced in Ayeduase, but in most cases the women return to the husbands when the child is a few months old. Evidence was obtained that the

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[2] The writer is indebted to the following members of the staff of the Gold Coast Department of Medicine: Dr. Susan Ofori Atta, Dr. Michael Wilson, and Dr. Mark Edington, and to Dr. Oku Ampofu of Mampong for the physical examinations. Other colleagues who helped to make this study possible have been listed in Part I of this series, and the author wishes again to thank these people for their help and cooperation.

interval between pregnancies now is often little more than a year, and even less for some.

PRACTICES IN AYEDUASE

The twenty-three children in the four households studied in Ayeduase (1) had all been delivered by untrained village midwives. According to Pickering (3), writing of Fanti midwives of the coast, their "stock-trade" includes native herbs and medications, as well as certain manipulations. The mothers in the four households in the forest had apparently found such services satisfactory, though three of five young mothers had visited maternal welfare clinics in Kumasi, the nearby city once. They had not returned during their pregnancies. From their comments, two had failed to return because of antagonism toward the over-zealous approach of literate husbands (from other villages) in attempting to persuade them to accept European customs. Another of these mothers had not felt it necessary to return to the clinic because her mother, a midwife, had provided all the advice thought necessary. The five older mothers had never received modern medical services.

The reports and attitudes of twenty-five young mothers and pregnant women interviewed from other homes in Ayeduase and in the vicinity were somewhat different. These women appeared to be some five years younger than the youngest of the mothers in the four households, which may have been a factor. Some were pregnant for the first time, while others had given birth to their first babies only a short time before the interviews. In general, they were enthusiastic about modern health services of the city, and also about information the writer gave them about nutrition and child care. The amused skepticism displayed by the older women was not apparent with this younger group. The main responses of these women to inquiries are given in Table 1. Twenty-two of them had visited a maternal welfare clinic, returning as advised, and fourteen used (or would use) the services of qualified, medically-trained midwives in the city. Thus less than half were depending on the untrained, village midwife for advice and help during delivery.

TABLE 1

Responses to inquiries on diet during pregnancy and other practices obtained from twenty-five young married women in or near Ayeduase

INQUIRY	RESPONSE		
	Positive	Negative	None
Are any foods forbidden because of traditional beliefs?	0	25	—
Does your appetite for certain foods increase?	2	21	2
Do you eat more food than usual?	10	15	—
Do you eat oranges daily?	14	11	—
Do you eat oranges now and then?	7	4	—
Do you drink palm wine?	14	10	1
If a relative dies, do you fast from one to several days?	19	6	—
Will a village midwife deliver your baby?*	14	11	—
Will a medically-trained midwife from the city deliver your baby?	14	11	—
Do you visit a maternal welfare clinic?	22	3	—
Do you visit a child welfare clinic?	15	8	2

* Past tense inferred for mothers who had given birth to babies.

The diet of none of these women was restricted during pregnancy because of taboos or traditional religious beliefs. In general, their diets were much the same as at other times (1), except that fourteen reported the regular use of oranges as a result of the advice received at the clinics or from the medically-trained midwife. However, most women, pregnant or otherwise, eat fruit when it is plentiful during work at the farms. Less than half the women interviewed reported nausea during the first months of pregnancy, and only two had marked cravings for particular foods. Most drank palm wine when the occasion arose, as at some festivity or religious celebration. As is the custom with the Ashanti of the area, nearly all fasted from one to several days when relatives died, and on memorial observations for these relatives as well. These fasts are not always absolute, however. Palm wine usually is drunk, and some women stated that they ate fruit. Two reported that they drank water only during fasts.

PRACTICES IN OTHER COMMUNITIES

The mothers of sixteen children in the four households in Dome and those of twelve children in the three groups in Mampong had chosen untrained midwives for the delivery of their children. Of thirty-two other women interviewed in these villages, nearly half used this traditional service. Even so, these women had had more experience with clinics than those in Ayeduase.

The women in these villages had no taboos concerning the use of any foods during pregnancy. A group of about thirty women interviewed during a class in child care at Mpamfukrom had formerly believed that palm nuts should not be used during pregnancy, but apparently this belief had been dispelled by the nutritionists of the Mass Education Unit in charge of the class. None of the women in these communities observed funeral fasts, but other practices appeared to be similar.

EARLY CARE AND FEEDING OF BABIES

Infants are given much attention and considerable care by their mothers. Physical contact is almost constant, as the infants are carried on their mother's backs or held in their arms much of the time. In Ayeduase, where the mothers of young babies were found in the

homes of their mothers, or in mother's brother's[3] home, there was considerable time for care and fondling. In the early weeks, the mothers and babies may sleep together in the afternoons. In Ayeduase, and apparently in other parts of the country, the close physical contact does not end immediately after the mother resumes activities at the farm or market; the infant may still be carried on her back, and the mother sleeps with the child until it has been weaned.

However, as the babies grow older and the mothers return to their husbands, resuming also more rigorous farming or marketing activities, small girls of the households or neighborhood take over much of the care and carry the babies fastened to their backs as the mothers had done. In Ayeduase, fretful or ill children were often carried or held by fathers. This was not observed in Dome (possibly because the men there had less leisure).

At still an older age, the care of a child may pass almost entirely to other women. Traditionally, a child in the Ayeduase area, and in other parts of the country as well, may have many foster mothers. Indeed, the word used for mother is used also for other female relatives. In a sense the children belong to the lineage of the family. In the matrilineal clan system which prevails among the Ashanti, inheritance is from mother's brother, and much authority lies with him, particularly as the child grows older. His household may become the home of the child, with his wife (or another woman of the household) acting as a mother. However, unless there is illness or social or economic disturbance in the home, a child is not usually separated from his mother at an early age. Even so, after the birth of another child, the former baby becomes just one of the several children found in most homes. All of these children appear to be loved and usually their care is much the same. Where care is inadequate in terms of western standards, it seems related to ignorance rather than to indifference. This, of course, does not exclude the possibility that some of the children may experience trauma during transition from babyhood. Indeed, as will be discussed later, the mothers recognize a psychologic decline at the time of weaning.

All babies are fed on a self-demand schedule. They were observed at the breast three or four times during intervals of from 1 to 1½ hr. However, nursing periods are short, often lasting no more than 5 min. They were said to nurse from three to four times during the night.

Investigations have not been made of either the quantity or the quality of the milk of Gold Coast mothers. Medical people of the area believe such investigations would be extremely valuable in the study of the physical condition of the babies.

Artificial feeding seems almost unknown. If the death of a mother occurs, there is usually another woman who can nurse the child. However, a motherless child seen in Mampong was fed diluted evaporated milk by a foster mother who had passed the child-bearing age. One child in Dome received supplementary feedings of evaporated milk from a nursing bottle during the mother's working hours. Doubtless as young couples leave the ancestral villages, artificial feeding will become more common.

TABLE 2

Feeding practices for babies reported by forty-three women in Dome and Mampong*

CATEGORY OF INFORMATION	NUMBER
Age of First Supplement	
Six to eight months	8
Eight to ten months	16
Ten to twelve months	12
Twelve to fourteen months	5
No supplement	2
Nature of the Supplement	
Corn dough gruel (*akasa*) with sugar	20
Corn dough gruel with sugar and milk*	16
Corn dough gruel with sugar and tea	2
Oatmeal porridge	1
Oranges (3–4 a week)	2
Age of Weaning	
Twelve to sixteen months	5
Sixteen to twenty-four months	26
Twenty-four to thirty-six months	3
Young mothers with no statements	9

* Quantity of milk described as "small."

The average age for the first supplementary food was reported to be between nine and ten months. It was actually observed earlier than this. It is possible that the mothers of older children gave only approximate ages. The Fanti women interviewed at Mpamfukrom stated that the first food is usually given between the ages of five and six months. Younger mothers interviewed in Ayeduase also gave (or would give) supplements earlier than the age reported by several in the households there (Table 2).

There was some variety in the nature of the first supplement. Older women in Ayeduase mentioned cooked tubers and plantain (*ampesi*). Younger women there, and many in other communities, gave fermented corn dough gruel (*akasa*). Five of twenty-five women interviewed apart from the four special households in Ayeduase fed (or would feed) orange juice as the first supplement, as would those in Mpamfukrom, and two of twenty-five in Mampong.

The use of fruit as the first supplementary food reflects the influence of the health services. Formerly many women of the country believed that oranges were associated with the deeply colored urine of ill children. Though not discussed, it seems that they may have erroneously connected the appearance of urine in blackwater fever (a severe malarial disease) with the fruit.

Most of the women reported the use of sugar with the gruel, but when observed, the amount did not exceed a teaspoon at most. Sixteen women reported the use of evaporated milk with gruel. This was not

[3] As kinship is expressed differently from the practices of people of European descent, the usual terms for the expression of relationships are inappropriate.

observed, except for one child in Mampong and for the three youngest in the well-to-do home in Accra. Even in these instances, the amount of milk did not exceed a teaspoon or two each day. According to medical people, some women have learned that the use of milk is desirable, but they have not learned to distinguish between the value of different quantities. They were said to report its use regardless of the frequency or quantity.

WEANING

The ages at which the children had been weaned varied considerably. A child in Household 2 in Ayeduase had been weaned at seven months, while a boy in Household 1 had nursed on occasions until he was eight years old. The second age is probably uncommon. From all evidence, most babies seemed to be weaned between the ages of one and two years. Mothers of from seventeen to about thirty reported an earlier age for weaning than those believed to be over thirty-five years of age. Pregnancy was the reason most frequently given by younger women, while older women in Ayeduase had weaned their babies because of farm work.

The time interval during which weaning takes place is not fixed. The older women had weaned the children gradually by staying at the farms for longer periods each day, during which time food was offered by other women in the homes. Most women reported that they nursed the babies until the second or third month of the next pregnancy. Abrupt weaning was reported by two women.

Anorexia is common at the time of weaning, and this may continue for several months. A child of two years in Household 2 in Ayeduase was said to have refused nearly all food for several months after weaning. During the first period of study he had only begun to accept food with any regularity, and even then he did not appear to be eager to eat. As the study progressed, however, he became almost belligerent in his demands for food and for a separate serving bowl as well. Most young children appeared more docile and seldom clamored for food. But, unless they were definitely ill, as in Household 4 in Ayeduase, they seldom refused food. After the ages of five or six years, most children appeared to eat with relish. Apparently many improve in health, or come to terms with conditions after weaning, so that appetite improves.

CHILDREN'S AILMENTS

As far as common complaints, such as cold, constipation, and malaria, are concerned, the women appear to be at the beginning of a transitional stage. Native herbs are used locally and internally, and charms are worn as well. Enemas are given by means of long-necked gourds, but commercial physics are used also. There is some use of quinine for malaria. Various tonics and linaments were sold in the food and sundry shop in Ayeduase, and in some instances remedies were purchased from a drug company in the city. In general, the men in the households in Ayeduase seemed to have more faith in modern remedies than the women. This apparently was not the case in the other communities. In Mampong, some two hundred women seek medical advice for their children four times each week.

The women know that children often are infested with worms, and some use a drug for the condition, though none seemed to take the condition seriously. In Ayeduase, one woman laughed when questioned, saying that every living person has worms.

The women in each area are aware that children often become seriously ill at the time of weaning, or soon after, recognizing as well many of the symptoms of kwashiorkor described by Brock and Autret (4) and more recently by the Joint FAO/WHO Expert Committee on Nutrition (5). The women of Ayeduase regard the illness as psychologic and feel the child's spirit has been crushed by the unborn child that the mother carries. Some believe also that the ill child is affected adversely by heat from the pregnant mother's body. The Fanti women hold similar beliefs, but believe also that the disease is connected with the fact that some women continue to nurse their children after they have become pregnant. Others think that there is an injurious emanation from the mother's body after the onset of pregnancy and that this affects the child as it sleeps in her arms. Finally, during a discussion with the Fanti women, they decided that certain women must carry the sickness in their wombs; otherwise there would

Mampong child, 2½ years old, wearing charm. Examination showed hair turned red around temples and soft in texture. Skin in shin area was classified as premosaic.

TABLE 3

Initial physical and laboratory findings (and initial and final heights and weights) for twenty-three children in Ayeduase

AGE	NUMBER OF CHILDREN	HEIGHT		WEIGHT*		NUMBER WITH SPECIFIED PHYSICAL CONDITION†																	LABORATORY FINDINGS	
		Initial	Final	Initial	Final	Dyspigmented hair	Hair soft in texture	Follicular keratosis (mild)	Premosaic skin	Conjunctivitis	Cheilosis	Angular stomatitis	Carious teeth‡	Enlarged glands¶	Spleen enlarged§	Liver enlarged§	Malarial parasites	Intestinal parasites	Tropical sores or skin ulcers	Bleeding or ulcerous gums	Poor muscular development	Fretful or apathetic	Edema (mild)	Hemoglobin‖	Red blood cells
Household 1																								
yr.		*cm.*	*cm.*	*kg.*	*kg.*																		*gm./100 ml.*	*million/cu.mm.*
6	1	109.7	113.0	19.3	19.8								1		1		1			1			8.8	2.63
7–9	3	118.0	123.2	20.2	21.6								1	2	1		3	2					8.5–8.9	2.59–2.84
10–12 (boys)	2	129.9	134.4	27.4	27.1									1			1						9.6–10.4	3.12–3.59
Household 2																								
0.5	1	68.6	—	7.5	7.9										1			1					8.1	2.75
2	1	78.7	83.6	8.4	11.7	1	1								1		1					1	9.6	3.84
4–6	3	105.6	107.9	17.1	17.8			1	1		1	1	1	2	3		3	2		2	2		8.6–9.6	2.84–3.45
8	1	121.9	127.0	19.1	21.8			1	1								1	1		1			9.3	3.41
12 (boy)	1	139.7	142.2	28.4	30.3			1	1				1		1		1	1					9.6	3.33
13–15 (boys)	2	141.6	145.6	29.6	30.2				1				1		1	1	2	2		1			8.9–10.4	2.53–3.39
Household 3																								
2	1	85.1	88.6	10.5	11.8										1		1	1			1		10.8	3.46
12 (girl)	1	127.0	129.5	25.5	27.2				1				1	1			1						9.5	3.14
13 (boy)	1	132.0	132.6	29.5	30.0				1				1		1	1	1						9.9	3.45
15 (girl)	1	124.5	124.5	25.4	27.7	1							1	1	1		1			1	1		10.8	3.48
Household 4																								
1–3	3	82.6	84.7	11.1	9.8	1	1			1			2	1	2	1	3	3	3	1	3	3	7.4–10.1	2.92–3.27
7**	1	104.6	—	16.4	—									1	1	1	1	1		1	1		8.0	3.11

* Weights taken in shorts or thin strips of cloth.

† In addition to conditions specified, hair or skin of 20 was described as dry; both hair and skin were involved for 14 of these 20; abdomens of 16 showed some degree of enlargement.

‡ One cavity identified for those indicated.

¶ Salivary, axillary, neck, and glands of the groins involved.

§ Enlargement of the spleens and liver ranged from one to two fingerbreadths below the costal margins.

‖ All hemoglobin determinations by visual colorimetry.

** Child died before the final height and weight could be taken.

TABLE 4

*Physical and laboratory findings for sixty-two children in Dome**

AGE	NUMBER OF CHILDREN	MEAN HEIGHT	MEAN WEIGHT	NUMBER WITH SPECIFIED PHYSICAL CONDITION†																		LABORATORY FINDINGS			
				Dyspigmented hair	Hair soft in texture	Follicular keratosis	Premosaic skin	Mosaic skin	Conjunctivitis	Cheilosis	Angular stomatitis	Carious teeth	Lumbar lordosis	Knock knees	Parotid glands enlarged	Spleen enlarged¶	Liver enlarged¶	Malarial parasites	Intestinal parasites	Tropical sores or skin ulcers	Bleeding and ulcerous gums	Hemoglobin‡		Red cell count	
																						Mean	Range	Mean	Range
yr.		*cm.*	*kg.*																			*gm./100 gm.*	*gm./100 gm.*	*million/cu.mm.*	*million/cu. mm.*
1.5	2	72.4	10.4	1	1							1				1	1	2		1		9.9	7.5–12.3	3.20	2.15–3.25
5	1	85.4	10.0	1							1					1	1	1		1		—	8.4	—	2.10
6	14	108.7	17.0	5	2	1	5	7	4	1	6	4	3		2	9	9	12	5	10	2	12.2	10.0–15.4	2.95	2.11–3.97
7	6	114.0	18.6	3		2	2	2	3	1		1		2	3	5	5	5	2	4	2	11.3	6.2–13.7	2.85	2.00–2.65
8	10	117.8	20.6	3		2	4	2	5	2	3	2	3	1	1	10	6	8	2	2		12.1	10.9–15.4	3.17	2.57–4.05
9	4	121.4	22.0	1		1	3	1	4		1	3	1		1	4	3	3	2	1		13.1	10.2–14.8	3.49	2.90–4.25
10	4	123.4	24.2			2	1			2			1			1	2	2	2	1		10.9	9.1–12.9	2.81	2.45–3.10
11	3	134.4	27.4			1	1	1		1			1		2	1	1	2		1		12.8	12.3–13.1	3.15	2.49–3.68
12	3	136.1	30.2				1	2	1	1			2			3	2	1	1	2		13.3	12.6–15.4	3.00	2.34–3.78
13 (boys)	2	137.2	31.4	1		1	1		1	1						1		2		1		13.4	13.9–13.2	3.14	3.11–3.18
13 (girls)	2	140.7	33.2			2		1	2			1				1				1		10.4	10.4–10.5	3.33	2.86–3.81
14 (boys)	6	137.9	36.1				2		2	1	1			1	2	1	2	4	2	1		11.5	10.0–15.2	3.57	2.80–4.50
16 (boys)	5	138.7	37.5				3									4	2	2		2	1	13.6	11.7–15.1	3.01	2.97–3.52
Total	62	—	—	12	5	12	23	16	22	10	12	12	11	4	11	42	34	44	16	28	5				

* Includes data for 14 children from the four special study households, eleven of whom attended school; the remainder of the 62 were inhabitants of the village or near-by villages who attended the village school.

† In addition to the conditions specified, abnormalities such as dryness of the skin and hair, yaws, impetigo, pigmented conjunctiva, and enlarged abdomens were identified for certain of the group; tonsilitis and a middle-ear infection were described for the two youngest children.

‡ All hemoglobin determinations done by visual colorimetry.

¶ The enlargement of the spleen and liver ranged from one to four fingerbreadths below the costal margins.

be no explanation for the fact that certain children develop it while those of others do not.

Of approximately seventy women interviewed concerning the sickness, only the Ga women of Dome associated the symptoms with the term "kwashiorkor, which is in keeping with the recent discussion of Williams (6). Not even the Queen Mother of the Ashanti had ever heard of the term. The Fanti of the coast refer to the sickness as *asun*.

PHYSICAL FINDINGS

Heights and Weights

Ayeduase. The heights and weights of the children in Ayeduase at the beginning of study and after an interval of approximately seven months are given in Table 3. It is the general opinion that the Ashanti of this area are small. Heights and weights taken by Colbourne, Edington, and Hughes (7) for a related group on the edge of the forest zone were less than European averages. No opinion was given as to whether this was racial or environmental. As the ages of most of the Ayeduase group were approximations only, comparisons with other groups were not made. Most of the children in the first three households gained in height and weight during the interval. Three children in Household 4 lost an average of 1.3 kg., with one child losing 3.5 kg. The oldest child of this household died during the last period of study, and final measurements were not obtained.

Heights and weights of ten infants in Ayeduase and vicinity are given in Table 5. Infants between four and eighteen days old compared favorably in size with Negro infants discussed by Scott (8) and Meridith (9). The weight of two infants of two months of age were comparable to those reported by Scott for Negro infants seen in private practice in the United States. Meridith has found evidence that the mean birth weight of Negro infants in the United States is almost 4 per cent less than that of white infants. By the age of one year, given comparable care, the difference is about 2 per cent. A difference in height of about 0.5 cm. disappears at from six months to one year of age. While the data for the infants from the two countries may not be strictly comparable, it is of interest that the Ayeduase infants were not widely different from either Negro or white infants in the United States.

TABLE 5

Age, sex, and height of ten infants in or near Ayeduase

AGE	SEX	HEIGHT	WEIGHT
		cm.	*kg.*
4 days	m	53.3	3.2
5 days	m	50.8	3.4
7 days*	f	47.0	2.4
7 days*	f	46.7	2.4
13 days	m	50.8	3.6
16 days	m	54.6	3.0
18 days	m	54.6	3.5
2 months	f	55.4	4.8
2 months	f	55.8	4.8
9 months	f	63.5	6.1

* These infants are twins. Five months later they weighed 4.8 and 4.5 kg. each.

Goodman (10) writes that babies born in Accra are small by standards for English and American babies at birth, but he has found that these babies gain weight more rapidly. Twins, who were weighed in Ayeduase, had doubled their weight at four days of age by the time they were five months old. Brock and Autret (4) have emphasized that the weight of African babies compares favorably with standards for Europeans for the first few months, but falls off thereafter. KP, the infant in Household 2, seemed to be an example of this. At six months of age (his birth date had been written on a wall by a school boy), his weight was 7.5 kg., just 0.46 kg. less than Scott's mean (8). At thirteen months, he weighed 7.9 kg., a gain of only 0.4 kg. in seven months.

Dome. Heights and weights of the children in Dome for whom birth dates were obtained are given in Table 4. Those recorded for the children from one and a half to five years of age were less than those given by Scott (8) for Negro infants of one year of age. When the measurements of the school children in the groups from six to ten years old were compared with those given by Meredith (11) for Negro school children in Los Angeles, the Dome children differed negatively by from about 6 to 10 per cent in height and from 17 to 23 per cent in weight.

Accra. The heights and weights of the three youngest children in the moderately well-to-do home in Accra were comparable to those of the Negro school children in Los Angeles. Also, with but two exceptions, the heights and weights of each member of this group compared favorably with the "Average Heights and Weights of Fairly Well Grown Boys and Girls" as given by Nicholls (12).

CLINICAL FINDINGS

Ayeduase. Clinical abnormalities identified for the children in Ayeduase are given in Table 3. Dryness of the skin and hair was common. Seven of the twenty-three children had ulcerous sores on the legs; six had had ulcerous sores about the buttocks or head; and there were three with scabies. Carious teeth were identified for eleven and bleeding gums for four. The abdomens of all young children were enlarged, and those of nearly all of the older children showed the condition to some extent. The spleens of fourteen were identified from one to two fingerbreadths below the costal margin. Various glands were enlarged, including parotids, sublingual, axillary, and groin. The hair of two children was soft and somewhat dyspigmented, while that of the oldest girl showed a generalized loss of pigment. Development ranged from poor to good, with seven rated in the first category and only four in the last.

Despite the evidence of poor health, sixteen were rated alert or moderately so. With the exception of five young children who were frequently fretful, the children were cheerful and exhibited a marked degree of fortitude and patience under all circumstances.

Dome. Abnormalities of the chil-

* Includes data for 14 children from the four special study households, eleven of whom attended school.
† In addition to the conditions specified, abnormalities such as dryness of the skin and hair, yaws, impetigo, pigmented conjunctiva, and enlarged abdomens were identified for certain of the group; tonsils and middle ear infection were described for the two youngest children.
‡ All hemoglobin determinations done by van Slyke technique.
§ The enlargement of the spleen and liver ranged from one to four fingerbreadths below the costal margin.

dren in Dome are given in Table 4. Though not mentioned specifically, dryness of the skin and hair was as common as in Ayeduase. Among the skin disorders described for the children, there were 12 cases of follicular keratosis, 23 of premosaic skin, and 16 of mosaic skin. There were also 28 children with sores on the legs. Conjunctivitis was identified for 22, and cheilosis and angular stomatitis for 10 and 12, respectively. Eleven of the school children had from one to five carious teeth while the teeth of a two-year-old child were decayed to stumps. The spleens of 40 of the school children were identified from one to three fingerbreadths below the costal margin, as were the livers of 32. In addition, the spleens and livers of 2 children not attending school were enlarged (and the absence of these conditions was not established for two other young children not having examinations). The hair of 12 children showed some degree of dyspigmentation, while that of 5 was unusually soft in texture.

Mampong. Various clinical abnormalities were identified for 16 children attending the clinic in Mampong, some of whom were the subjects of the dietary study. The following were recorded: hair dyspigmented, 8; hair altered in texture, 1; premosaic skin, 4; diarrhea, 10 (history only); fever, 8; apathy, 4; and enlarged livers, 2. Malaria was practically eliminated as a factor for 7 of the number (by the absence of enlarged spleens, no history of fever, and negative blood films). Of the 7 children, 5 had dyspigmented hair, 4 premosaic skin, 7 diarrhea, 5 anorexia, and 1 an enlarged liver.

LABORATORY FINDINGS

Ayeduase. Despite the number of enlarged spleens in Ayeduase children, malarial parasites were identified for only three. This finding, however, was not evidence that the parasites were absent; they may have been present in exo-erythrocytic form. Roundworm was the most common intestinal parasite. Ova were identified for twenty, with a few cases of hookworm or thread-

Three-year-old in Mampong, considered to suffer from incipient kwashiorkor. Mild edema of face is evident. Examination showed spleen one fingerbreadth below costal margin, as well as enlarged liver. The child also suffered from intestinal parasites. Hemoglobin was 11.1 gm. per 100 ml.

worm also. All were anemic in terms of usual standards. Mean hemoglobin in grams per 100 ml. for children in each household was between 8.4 and 10.2. The mean red blood cells ranged between 2.79 and 3.58 million per cubic millimeter for the four households.

Dome. Malarial parasites were identified for 41 of the school children and for 3 young children not attending school. Intestinal infestation in Dome alone was much less than in Ayeduase. Only 2 of 14 children for whom examinations were made in the homes were so afflicted. Ova were identified for 16 of all school children, but more than half the number came from small settlements 1 or 2 mi. from the village (a noteworthy point in terms of pure water supply, as many in Dome obtained water from the steam engine stopping in the station). Mean hemoglobin for the 59 school children ranged from 10.4 to 13.6 gm. per 100 ml. for the different age groups represented; mean red blood cells ranged from 2.85 to 3.57 million per cubic milliliter. Mean hemoglobin for 3 children under six years of age was 9.4 gm. per 100 ml., while red blood cells were 3.4 million per cubic milliliter.

Mampong. Because laboratory facilities were not available in Mampong, hemoglobin determinations were carried out in Accra for three children under three years of age. Mean hemoglobin was found to be 9.1 gm. per 100 ml.

Accra. Of the nine children in the moderately-well-to-do household in Accra, physical examinations were done on seven, and laboratory tests on eight. No abnormalities were diagnosed on physical examination, and all children were judged alert. Three showed only "fair" development, while that of the other four was considered "good." Laboratory tests showed that hemoglobin[4] ranged from 12.7 gm. per 100 ml. for the six-year-old boy to 16.9 gm. for a fourteen-year-old boy. Red cell count ranged from 4.74 million per cubic millimeter to 5.16 million, a range which fell well within the limits of normal. Roundworm was identified for two of the girls who had recently joined the family. One of the older girls developed malaria after the examinations had been made.

CORRELATION BETWEEN DIETS AND PHYSICAL FINDINGS

As reported earlier (1), even after corrections for the mean environmental temperature, the caloric value of the village diets was low in terms of allowances of the National Research Council (13). For some age groups, the difference was so large that the gains in weight made by many in the three households in Ayeduase appear anomalous. A partial explanation perhaps may be found in the relatively small amount of activity of most of these children. The reference children discussed by the FAO Committee on Calorie Requirements (14) were described as "very active." Further, where the older children are concerned, more hours may be spent in sleep than are spent by western children of similar age. As only one household was handled at a time during the quantitative study, it is un-

[4] Approximately half of this group of hemoglobin determinations were done with the Grey-Wedge photoelectric colorimeter.

likely that unrecorded meals were eaten. There is, of course, the possibility that a child received an occasional piece of boiled tuber or plantain while in the home of a neighbor or relative. In view of the small quantity of flesh food and soup, it seems unlikely that these were available as snacks. None of these factors were sufficient to offset the quality and quantity of the diet of Household 4 in Ayeduase, where weight was lost and all were practically moribund. The death of one child in this household was doubtless related to inanition.

True growth, of course, implies a laying down of protein as muscle, organ, nerve, and bone tissue, so that adequate protein is needed and other nutrients as well. With the small amount of protein in the diets and the low levels of other nutrients, the extent of true growth is questionable. Adaptation to the prevailing level may have taken place to some extent. Bray (15) has shown that underdeveloped children in the Gambia, whose diets were similar to the more generous village diets in this study, retained more nitrogen than well nourished American children. However, even though the children in this study may have adapted to an extent to the level of protein, most showed some signs of protein deficiency. There can be little doubt that the younger children were not seriously affected by this. The low caloric level of the diets and the lack of preformed vitamin A doubtless were involved in the production of the dry skin and hair, though harmattan conditions (dry, dust laden wind from the desert) at the time of the examinations cannot be overlooked in Ayeduase, nor can the use of crude soap by most of the children.

Cheilosis and angular stomatitis were more prevalent in Dome than in Ayeduase. It may be that the dried cassava used in Dome provided much less protection than the fresh foods used as staples in Ayeduase.

The enlarged livers may have been related to a lack of protein, particularly where the young children were affected. However, as emphasized by Colbourne and associates (7), malaria may well have been a large factor. Each child in Ayeduase with an enlarged liver also had some enlargement of the spleen, as did thirty of those in Dome, so that malaria cannot be eliminated. Four children in Dome and one child in Mampong had the condition with neither the enlargement of spleen nor malarial parasites.

Three factors were probably involved in the production of the anemia: the quality of the diet, the occurrence of malaria at some time, and the presence of intestinal parasites. Williams (6) has pointed out that roundworm can cause anemia as severe as that caused by hookworm.

Changes in the color of skin and hair and texture of hair suggest kwashiorkor. However, intestinal infestation, malarial parasites, and the poor quality of the diets in general are evidence that it was not uncomplicated kwashiorkor in the sense of protein deficiency alone. In any case, the younger children with the condition were obviously ill. Most were held during the day and apparently did not walk or stand unaided.

The final cause of the death of the child in Household 4 in Ayeduase was not learned. She had been examined some six months earlier with the findings given in Table 3. Her diet, as that of others in this group, was meager. Her death occurred when the writer was in another area. It is well known that undernourished children succumb quickly to respiratory infections and to malaria. The season favored both conditions. The other children of the group were seen soon after the death, and the condition of each had worsened during the interval.

SUMMARY AND CONCLUSIONS

The diet of children and young people living in the Gold Coast has been reported previously (1); results of laboratory determinations carried out on certain local foods have also been given as well as the preparation and estimates of total food consumption of some of the adults. The present paper has been concerned with aspects relating to the welfare of the children and with physical findings.

In the villages, the caloric values of the diets per child per day ranged from 423 for a group from one to seven years of age to 1,264 for a group from five to thirteen years old. In a moderately well-to-do urban home, the caloric value of the average diet of a group from six to sixteen years of age was 2,154. In the villages the protein available per child per day ranged from 11 to 41 gm., while it was 52 gm. in the urban home. Only the vitamin A, ascorbic acid, and iron values met or approached the allowances of the National Research Council for comparable age groups, where village diets were concerned. Except for calcium and riboflavin, the diet in the well-to-do home compared favorably with the allowances.

Cured fish with low moisture content was found to be a concentrated source of protein, and since much of the bone is edible, of calcium also. Cassava and plantain, important as staple foods, retain significant amounts of ascorbic acid even after boiling and pounding.

Some of the women are commencing to accept modern medical services, but this is by no means universal. Moreover, these services are not yet readily available for all. Infants receive supplementary foods between six months and one year, but the nutritional value of these is not great. Weaning usually takes place between the age of one and two years, with younger ages more common than formerly. Children develop anorexia at weaning and many display several abnormalities.

In general, the village children are smaller than those in the United States at similar ages. Heights and weights of the few infants seen were comparable to those of Negro infants from lower middle class homes in the United States and were very much the same as those of white babies, also. Symptoms suggestive of undernutrition and of malnutrition were identified for

most of the village children. Malarial and intestinal parasites were common findings.

The problem of the children is complex. Information concerning the chemical composition of much of the food is lacking. Neither the utilization of the food nor the complete effect of the parasitic diseases is known. The number of children studied in each area was small. Even so, certain inferences seem valid.

(a) After adjustment to weaning takes place, appetite slowly returns, general health improves to some extent, and a degree of adaptation to the diet and the parasitic diseases occurs for some of the children. Doubtless many make only a partial adaptation at best.

(b) Foods of the area offer the possibility for a more nutritious diet. Greater use of legumes, of coco-yam leaf (or other leaves), and of fruit would achieve this. Eggs, not really taboo, would help further.

(c) Traditional cookery seems to be enjoyed by the older children.

(d) Traditional dishes may need modification at the time of weaning and soon after, as the foods offered are bulky in nature and young children often have small inclination to eat after the first pangs of hunger have been allayed.

(e) The psychologic factor in the anorexia of children at weaning might be minimized by more attention at this time, so that the child does not feel displaced in the mother's affection.

(f) A greater use of concentrated soups and stews, of cereal grains—with or without eggs—and of fresh fruits before weaning would not only provide more nearly for the needs of children than do the present supplements, but would acquaint them with a larger variety of food so that rejection at the time of weaning would be less likely.

(g) Programs of direction and self-help, such as those planned and administered in some areas, are needed by all village women. Such programs are well received and the women learn readily.

(h) Detailed study of local foods and of mother's milk is desirable, as is greater information concerning the diets of mothers.

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AN ANTHROPOLOGIC NOTE

For the student of human behavior, the outstanding value of this study is its demonstration of how effectively a nutritionist, sensitized to the role of cultural patterning in influencing the typical reactions of a people, can analyze food habits from a cross-cultural point of view. Dr. Grant has done this in terms of traditionally established values as well as in terms of biophysical needs and responses.

It is undoubtedly because of this humanistic approach that her work became so meaningful to the people she studied, calling forth responses found in the enthusiastic comment of no less a personage than the Asantehene, the traditional ruler of the Ashanti people of the Gold Coast: "Mrs. Grant went to the villages. She watched to see what the women used in cooking, and how they used it, and really learned what we eat. She didn't advise us, as others have done, to sell what we grow and buy other kinds of food to eat out of tins. When I talk to my people, I tell them what Mrs. Grant told me: keep your vitamins; put some greens here, some groundnuts (peanuts) there in the things you eat. Put more vegetables in your stew."

There is still another aspect of Dr. Grant's study that merits comment. The stress laid on the pathologic in much of the dietary researches at once strikes a student of culture. What is often overlooked, he feels, especially in those disciplines whose relationship with the medical sciences is close, is that the pathologic, one might say by definition, only exists when projected against the background of the normal. This is especially true in cross-cultural research, since in these cases, the nutritional values in pre-established food habits must be understood before studying the respects in which a given diet may be deficient.

The manner in which Dr. Grant established the base-line of the normal before deviations from it were recorded, assessed, and analyzed, thus constitutes in itself an important methodologic contribution. Thus, through her cross-disciplinary approach, she points toward new avenues of research in both anthropologic and nutritional science.—*Melville J. Herskovits, Ph.D., Program of African Studies, Northwestern University, Evanston, Illinois.*

Plan now to attend the 38th Annual Meeting of the American Dietetic Association, October 18–21, 1955, in St. Louis. For news of the advanced planning being done in preparation for this Meeting, see page 740.

Nutrition and Behavior

Psychologic Changes in Acute Starvation with Hard Physical Work[1]

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In nutritional research one can readily become lost in the details of examining urinary excretions of this or that compound, the level of a particular constituent in the blood, or the amount of fat in the living human or animal body. Consequently, it is useful to remind ourselves from time to time that the practical goal of the science of nutrition is to allow the attainment of full physical and mental health, longevity, and the maintenance of a high performance capacity.

Unquestionably, a great deal has been learned about the etiology and therapy of a series of diseases of nutritional origin, the classical examples being rickets, pellagra, scurvy, and night blindness. However, we have barely scratched the surface in evaluating the role of diet in the long-term maintenance of health and of life itself, even though there is evidence of important relationships, i.e., effects of rate of growth on longevity (1); effects of obesity on development of degenerative diseases (2); and relation between dietary fat, blood cholesterol, and coronary disease (3).

Similarly, but for somewhat different reasons, reliable knowledge of the relations between nutritional factors and the psychologic aspects of man's fitness, including his manual and intellective performance and personality, is meager. Aren't folkways and the trainer's idiosyncrasy rather than tested knowledge the deciding factors in the diet of the football team? Yet here we deal with readily measurable behavior, susceptible to empirical investigations. The situation becomes progressively worse as we consider industrial output, creative intellective and artistic work, or spiritual life and religious experience. It is of interest that all of the great religions have been concerned, in varied degrees, with dietary practices. In particular, emphasis has been placed on the salutary effects of fasting.

The methods for describing the sensory aspects of man's fitness and, especially, his motor and intellective functions cannot be considered fully satisfactory (4). However, the instruments for a quantitative characterization of personality have particularly striking methodologic limitations and deficiencies. Matters are complicated by the fact that in nutritional research the experimental periods may extend from several days to many months, and the frequency and the intervals between repeated testing sessions vary greatly. For the study of personality in the context of nutritional research, we have used a variety of approaches—direct observation and interviews, ratings, standard personality inventories, so called projective tests (such as the Rorschach ink blots), and miniature test situations designed to sample behavior which has potential value for personality assessment. The personality inventories have been designed either in the framework of psychiatric classification of mental diseases or in reference to personality traits. The Minnesota Multiphasic Personality Inventory represents the first type, Cattell's "The 16 Personality Factors Test" represents the second type. The psychometric techniques used in the study of prolonged caloric deficiency have been described in detail (5).

The overwhelming majority of dietitians are more familiar with the biochemical than with the psychologic aspects of the problem. This creates difficulties in the handling of the subject. At the same time, this very fact should make the topic interesting for dietitians (and makes it challenging for the writer).

For better or worse, my job will be forcibly simplified by several factors:

(a) The limitations of space make impossible a detailed systematic or exhaustive historical treatment. I had the opportunity to survey the field of psychodietetics, with emphasis on the impact of

[1] Results reported here were obtained in part under a contract, recommended by the Committee on Medical Research, between the Regents of the University of Minnesota and the Office of Scientific Research and Development. Important financial assistance was also provided by the Sugar Research Foundation, Inc., New York City, and the National Dairy Council, operating on behalf of the American Dairy Association, Chicago. Presented at the 37th Annual Meeting of The American Dietetic Association in Philadelphia, on October 28, 1954.

diet on behavior, at the Third International Congress on Nutrition which met in Amsterdam in September 1954 (6).

(b) The emotional implications of eating in children and adults, the symbolic values of food, and motivation as a crucial factor in modification of one's eating habits have been discussed previously and are readily available (7–10).

(c) Investigations in the field of "experimental psychodietetics," the laboratory study of the psychologic impact of diet and nutrition have received less attention. It is this field which will be the focus of this presentation. In the Laboratory of Physiological Hygiene, extensive use of psychometric techniques has been made in studies on the effects of experimentally varied intakes of vitamins, especially vitamins of the B-complex (11–18) and of calories (19–27). In this presentation, the approach will be illustrated by describing in some detail a study on the psychologic effects of acute starvation combined with hard physical work.

This investigation was carried out in the framework of studies on deterioration of fitness under physiologic stress. Several of the stresses involved diet; others were imposed by changes in the physical environment (such as a high environmental temperature) or involved alterations in the mode of life and in the physiologic status of the human organism. Very hard physical work or lack of sleep would fall into this category. The experimental conditions have realistically duplicated the relevant aspects of a number of practically, especially militarily, important situations. These studies were motivated by interest in the rate of deterioration of fitness in a variety of emergency situations, the factors limiting man's performance capacity, and, specifically, the role of nutrition in these situations.

Man's "fitness" is an integral of many functions. Its comprehensive, quantitative assessment is an interdisciplinary task which involves a number of sciences—biochemistry, physiology, psychology—which together form an experimentally oriented human biology.

This approach has been also used in the present study. The physiologic responses have been described elsewhere (28, 29). This report will be focused on the psychologic aspects, with emphasis on motor functions. The investigator responsible for describing manipulative performance and its deterioration under stress is faced from the outset with a difficult choice between complex, concrete performance situations, closely related to man's occupational activities, and the use of simple, abstract tests of motor abilities. It is the latter type of test situations that was applied here.

CONDITIONS AND PHYSIOLOGIC RESPONSES

The study of the effects of acute starvation, with water available *ad libitum*, was carried out on a group of twelve normal young men who went without food for four and a half days on two occasions, separated by a period of six months. The weight losses for the same period of food deprivation were very similar. Except for the intellective tests, which were administered only on the first occasion, the results refer to the second experiment.

TABLE 1

Daily activity schedule for five days of starvation

TIME	ACTIVITY	OBSERVATIONS
7:00–8:00 a.m.	Rest	Basal measurements (pulse, blood pressure, hemoglobin, postural adjustment); body weight
8:00–9:00	Walk	Pulse, blood sugar, oxygen consumption, respiratory quotient
9:00–9:15	Run	Time of run and pulse or maximal oxygen intake
11:00–12:00 noon	Walk	
12:00–12:15 p.m.	Walk and stand	Psychomotor tests
1:45–2:00	Stand	Body sway (ataxiameter)
2:00–3:00	Walk	Pulse
6:15–7:15	Sit	Ratings, inventories, intellective tests

The men were studied on what we call chain-schedule, with 15 min. allowed per man per procedure or set of procedures. For some tests and activities, a multiple of this basic unit was used. A sample of the schedule for a day is given in Table 1. Physical work consisted in walking for several hours on an inclined motor-driven treadmill (3.5 m. p. h., 10 per cent grade). This represents strenuous physical exercise, equivalent to an average expenditure of 550 calories per hour. The average total caloric deficit may be estimated at about 13,500 calories at noon of the fourth day, and about 14,500 in the evening of the fourth day. These periods correspond to the administration of the psychomotor battery (12:00–12:15 P.M.), and of ratings and intellective tests, respectively (6:15–7:15 P.M.).

The data characterizing some of the physiologic responses of the body to the stress of starvation combined with hard work are given in Table 2. Nude body weight was recorded each morning after the subjects emptied their bladders and before they ingested any fluids or foods (on the control day). On the morning of the fourth day, they showed a loss of 4.6 kg. (about 10 lb.). By the evening of the fourth day, the weight loss would have been about 11 lb. The initial loss (and the recovery) of body weight were surprisingly rapid. Thus almost 40 per cent of the total five-day weight loss occurred within the first 24 hr., indicating an excessive loss

TABLE 2

*Some physiologic responses of twelve men to starvation with hard work**

MEASUREMENT	MEAN VALUES, CONTROL DAY	MEAN VALUES, FOURTH DAY OF STARVATION	DIFFERENCE BETWEEN MEASUREMENTS
Body weight (kg.)	70.5	65.9	−4.6
Plasma volume (liters)	3.4	2.8†	−0.6
Extracellular fluid (liters)	12.3	11.3†	−1.0
Blood sugar at work (mg./100 ml.)	80	62	−18
Work pulse rate (beats/min.)	129	151	32
Treadmill run (seconds)	240	134	−106

* From Taylor *et al.* (28) and Herschel (29).

† Determined on the fifth day of starvation.

of body water (dehydration), even though the water intake was not limited. Both the plasma volume (Δ = 18 per cent) and the extracellular fluid (measured by thiocyanate dilution, Δ = 8 per cent of control) showed a decrease.

Acetone excretion was not determined in this study, but it has been examined in other experimental series in which it was established that the ketone body excretion under these conditions is controlled, primarily, by the caloric deficit. Acidosis is likely to have been one of the factors accounting for the loss of fitness.

The blood sample for the determination of the blood sugar was obtained from the antecubital vein during continued walking. The value in the table refers to the first hour of walking. This value was within normal range on the first day of starvation, decreased markedly the second day, with a mean of 53 mg., showed some improvement on the third day, with a mean of 59 mg., and the fourth day, with a mean of 62. Even then it was substantially below the control level. This factor may have been involved in the decrease of the speed and coordination in manipulative tasks (30).

The pulse rate was counted three times during the last 5 min. of the first hour of walking on the treadmill. The increase in pulse rate reflects the stress placed on the cardiovascular system. The time of run on the treadmill (at 7 m. p. h. and 8.6 per cent grade, to exhaustion or to a maximum of 5 min.) served as a measure of endurance in severe physical exercise. There was a marked reduction in this aspect of fitness.

PSYCHOLOGIC TESTS AND QUESTIONNAIRES

The psychomotor battery included two tests of strength—hand grip and back pull dynamometer; three tests of speed—two-plate tapping, speed of coordinated hand-and-arm movements (Fig. 1), and a choice-reaction time which involved bending the knees and striking the appropriate large key placed at the side of the moving treadmill; a test of

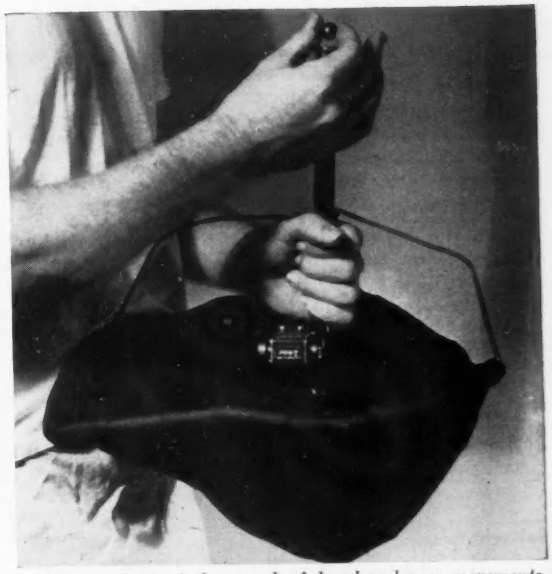

FIG. 1. *Test of the speed of hand-and-arm movements. The score for this test indicates the number of times a ball-bearing was passed through the 1-ft. pipe in 1 min.*

eye-hand coordination involving the tracing of a grooved pattern; and a measure of body sway (31).

As insurance against the loss of data due to the breakdown of equipment, the instruments for automatic presentation of signals and stimuli and for recording the responses in terms of time and frequency were made in duplicate.

Changes in motor functions are summarized in Table 3.

All three tests of speed showed statistically highly significant decrements during the fourth day of fasting. Interestingly enough, there was no decrement in hand grip and the decrement in back-pull did not reach a level of statistical significance. On the other hand, statistically highly significant deterioration was obtained in both measures of "pure" coordination, and a significant increment was observed in the body sway. The score combines the sway in the lateral and dorsoventral direction during 2 min.

In addition to motor functions, some sensory functions were examined. Flicker fusion frequency, included in the battery as a potential measure of an impairment of the central nervous system, showed a small but fairly consistent decrement. The fluctuations of the perspective of a cube design, viewed for one minute, showed no change.

Intellective functions were measured by a battery of six short tests (32). Contrary to the suspicion of the "unreliability" (lability, variability) of scores obtained with tests of intelligence, it has been our repeated experience that with well motivated subjects, intellective functions are surprisingly resistant to the stress brought about experimentally by

TABLE 3

Changes in psychomotor functions during starvation with hard work

TEST	MEAN VALUE, CONTROL DAY	MEAL VALUE, FOURTH DAY OF STARVATION	DIFFERENCE BETWEEN TESTS
Speed			
Tapping (taps/10 seconds)	71.6	61.3	−10.3
Hand and arm movements (score in 1 min.)	76.2	65.2	−11.0
Complex reaction time (0.01 second)	42.4	51.4	9.0
Strength			
Hand grip dynamometer (kg.)	56.1	56.6	0.5
Back pull dynamometer (kg.)	161.6	153.7	−7.9
Coordination			
Pattern tracing (no. of errors)	93.3	103.2	9.9
Pattern tracing (duration of errors, 0.1 second)	88.8	109.5	20.7
Body sway (ataxiameter) (2 min. score)	11.5	16.3	4.8

nutritional deficiencies. In only one instance, the test of verbal fluency ("First Letter Test"), did the decrement reach the 5 per cent level of significance.

In the Minnesota Multiphasic Personality Inventory, the mean scores increased, i.e. changed in the direction characteristic of poor adjustment and mental illness, except for hypomania, in which there was a small, statistically non-significant decrement. The picture is similar to what we obtained in prolonged food deprivation. The marked changes on the scales of the "neurotic triad"—hypochondriasis, depression, and hysteria—were dominant.

All men completed all psychomotor sessions and the physical exercises except for one subject who could not carry out the scheduled amount of walking on the treadmill because of nausea and stomach cramps.

The principal subjective symptoms and complaints included tiredness, in walking and at rest; muscular weakness; and decreased ability to concentrate. The men felt sleepy and their self-initiated activities decreased. Nausea was a common complaint after the exhausting runs on the treadmill. This type of physical work was also frequently accompanied by pain in the side. In spite of the availability of water, the men complained of dryness of the throat. Throughout, subjectively the absence of food was not important. On the fourth day of starvation the "desire for food" received an average low rating of 1.4 (on a scale from 0 to 10), as compared to a rating of 2.9 for "desire for water" and 4.8 for "tiredness in walking."

SUMMARY AND CONCLUSIONS

In men undergoing four days of starvation combined with hard physical work, there was a dramatic decrease in endurance, as measured by running on the treadmill to exhaustion. Statistically highly significant deterioration was noted in the tests of speed and in eye-hand coordination. Intellective tests showed little or no impairment. In the Minnesota Multiphasic Personality Inventory there was a large increment on the psychoneurotic scales. Tiredness, muscular weakness (with no counterpart in measured strength), and soreness of muscles dominated the subjective symptoms.

Information obtained in this study throws additional light on man's performance capacity under physiologic stress of nutritional origin. The study provides a useful background for "applied" research on the reduction of deterioration in fitness which can be obtained by feeding emergency ("survival") rations. This problem is currently under active study at the Laboratory of Physiological Hygiene, under the joint sponsorship and financial support by the Quartermaster Corps (Food and Container Institute, Chicago) and The Office of the Surgeon General (Medical Nutrition Laboratory, Denver).

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RADIATION STERILIZATION

Developments in radiation sterilization of foods received wide attention at the 15th Annual Meeting of the Institute of Food Technologists in Columbus, Ohio, last month. At present there are more limiting factors than promising possibilities, but speakers reminded the food technologists that these are pioneer days in the radiation era.

Present status in general is: High voltage cathode rays will sterilize a wide variety of foods in a matter of seconds. However, at high levels, undesirable changes in color, flavor, and odor occur in most foods. The inactivation of enzymes requires more exposure than do the microorganisms that are common causes of food spoilage. *Clostridium botulinum*, the most dreaded of the organisms attacking food, requires varying dosages according to type, but all are on the extreme side. Nutritional effects are not yet fully assessed, but the picture is not too dark on the basis of preliminary returns.

Proctor and associates from Massachusetts Institute of Technology reported that cathode ray treatment of meat and vegetable products can extend storage life at refrigerator temperatures above freezing from several weeks to several months.

At the University of Michigan, L. W. Brownell and H. A. Harlin have found that gamma radiation of bread, cake, and all-purpose flours at a fairly low dosage (20,000 rep) did not affect baking properties of the flours, and that insects and weevils were destroyed. Eggs of insects were also made sterile at this level of treatment.

Dr. Charles Glen King, Scientific Director, The Nutrition Foundation, Inc., reviewed studies of the effects of irradiated foods fed to animals. A vitamin E deficiency developed when irradiated meat was included in the experimental diet. However, no evidence of specific abnormalities was observed in the tissues of the experimental animals.

Drs. G. M. Dack and R. O. Wagenaar, Food Research Institute, University of Chicago, have found high resistance to irradiation in *Clostridium botulinum* spores inoculated into surface-ripened cheese. It took 800,000 to 1,100,000 rep to inactivate type A spores, 550,000 rep to inactivate type B. At high toxin levels, 7,800,000 rep were required.

For those expecting an answer to the question: how far is radiation sterilization from the goal of commercial use? the candid answer would have to be expressed in terms of years.

Effect of Alloxan in Rats Fed Cornstarch-, Sucrose-, and Lactose-Diets[1]

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WITH the introduction of alloxan as a means of producing experimental diabetes in animals, investigators became interested in the influence of diet on the response of the animal to this chemical. Most of the studies have involved variations in protein, fat, or carbohydrate levels of the diet preceding or following the administration of alloxan, and results have been interpreted chiefly on the basis of mortality rate or severity of diabetic symptoms.

Houssay and Martínez (1), in comparing the effect of various dietary fore-periods, observed that the toxic and diabetogenic effects of alloxan were increased in rats on low-protein diets. In contrast, Rose and György (2) report that variations in the protein content of the diet had little effect on survival. There is support, however, for the findings of Houssay and Martínez in the study reported by Mann and Stare (3) in which it was found that high protein levels favored survival in rats already made alloxan diabetic.

Houssay and Martínez have also studied the influence of different types of fat on the toxicity of alloxan. The diabetogenic effect of alloxan was greatly intensified following the feeding of high-lard or ox-fat diets. Olive oil and butter in high-lard or ox-fat diets did not modify the action of alloxan, but high-oleomargarine or corn-oil diets had a slight protective action. György and Rose (2, 4) report an appreciable decrease in the toxicity of alloxan when diets lacking or deficient in fats were fed. They found only a slight advantage of coconut oil over lard and hydrogenated cotton seed oil in high-fat diets. Once diabetes has been established, a diet rich in fat relieves the severity of the diabetic symptoms (5–7).

Houssay and Martínez (1) noted that high-carbohydrate diets were intermediate in effect between high-protein and high-lard diets. They found with partially pancreatectomized rats on high-carbohydrate diets that diabetes appeared first in overfed rats, next in those fed *ad libitum*, and last in the underfed. Since alloxan diabetes, according to Lukens (8), might be regarded as a partial pancreatectomy chemically induced, the latter observations may well apply to alloxan diabetic rats.

The influence of different forms of carbohydrate on susceptibility to alloxan damage has to the knowledge of the authors not been previously investigated.

EXPERIMENTAL PROCEDURE

The diabetogenic response to alloxan was studied with rats on diets containing carbohydrate in three different forms: cornstarch, lactose, and sucrose. The rats were obtained from the Purdue Biochemistry Colony. Rats with an initial weight of approximately 60 to 100 gm. were maintained on the diets fourteen to twenty days prior to the injection of the alloxan. The percentage composition of the diets is given below:

Casein	18
Wesson modification of Osborne-Mendal salt mixture (9)	4
Crisco	10
Cod-liver oil	5
Dried brewer's yeast	10
Carbohydrate	53

The rats were starved for 48 hr. before the administration of the alloxan. They were then injected intraperitoneally by means of a hypodermic syringe with a freshly prepared 2½ per cent solution of alloxan monohydrate.[2] At first a dosage of 175 mg. per kilogram body weight was administered. However, because at this level the death rate within 24 hr. to seven days was very high, the level was subsequently reduced to 150 mg. per kilogram body weight.

The rats on the diets in which the carbohydrate was cornstarch or sucrose grew at a normal rate in

[1] Received for publication May 12, 1954.

[2] Obtained from Eastman Kodak Company.

the period preceding injection and were healthy, vigorous animals at the end of that period. Those receiving the lactose diet were retarded in growth and were definitely poorly nourished. Because it was considered that the difference in nutritional condition might be an influencing factor affecting susceptibility to the action of alloxan, a fourth group of rats was fed the cornstarch-containing diet at a restricted level (5 to 7 gm. per day) during a two-week period preceding administration of alloxan to try to produce a lowered nutritional state comparable to that of the rats on the lactose diet.

Blood sugar levels were determined preceding injection with alloxan and 24 hr. thereafter. Determinations were repeated at the end of seven and fourteen days on rats that survived that long. The procedure used for determining blood sugar was a modification of Folin's micro method as described by Folin and Malmros (10). At first, readings were made with a DuBosq colorimeter; later, the method was adapted for use with the Evelyn photoelectric colorimeter. Blood sugar levels of 200 mg. and above per 100 ml. blood were regarded as diabetic.

TABLE 1

Response of rats on the different diets to alloxan

LOT NUMBER	TIME ON DIET	AVERAGE WEIGHT GAIN FOR PERIOD	RATS INJECTED WITH ALLOXAN	RATS BECOMING DIABETIC	BLOOD SUGAR OF DIABETIC RATS	
					Range	Average
Cornstarch Diet						
	days	*gm.*			*mg./100 ml.*	*mg./100 ml.*
1	14	61	4	4	459–525	498
2	14	49	4	3	256–294	272
3	14	34	4	4	259–541	423
4	18	61	3	2	554–615	584
5	20	95	4	3*	216–600	389
Sucrose Diet						
1	14	41	4	4	494–505	501
2	14	44	4	2*	250–444¶	347
3	14	35	4	3†	235–435	362
Lactose Diet						
1	14	−20	4	1‡	—	277
2	14	−8	4	1§	—	200
3	14	−2	5	1‡	—	465
4	20	−6	4	0‡	—	—
Restricted Cornstarch Diet						
1	14	20	4	3	263–556	448
2	14	8	5	1‡	—	588
3	14	17	4	0	—	—

* Diabetic blood sugar level not reached in one rat until after 24 hr.

† Diabetic blood sugar level not reached in two rats until after 24 hr.

‡ One rat died before end of 24-hr. period.

§ Two rats died before end of 24-hr. period.

¶ Blood sugar below diabetic level on seventh day.

DISCUSSION OF RESULTS

Findings of the study are presented in Tables 1 and 2. As judged by the percentage of animals developing diabetes, the highest susceptibility to the diabetogenic effects of alloxan was found in the rats fed the cornstarch diets *ad libitum*. In Lot 2 of this group, however, the blood sugar elevation was relatively small. Susceptibility was slightly less in the rats on the sucrose diets with the exception of Lot 1. The fact that these rats were older and larger than those of Lots 2 and 3 may have been an influencing factor. The rats on the lactose diet showed the lowest susceptibility.

When the intake of the cornstarch diet was restricted, susceptibility was decreased, only 33 per cent of the cornstarch-restricted groups becoming diabetic as compared with 84 per cent of those fed the cornstarch diet *ad libitum*. This suggests that the nutritional status of the animal may be an important factor in determining whether diabetes will result from the administration of alloxan. In fact, this may explain the variance in susceptibility with the different forms of carbohydrate. Using average weight gains as a measure of nutritional status, there was a direct relationship between the latter and the percentage of rats on the different diets that became diabetic following the injection of alloxan.

The lactose-fed rats which were severely impoverished nutritionally frequently failed to survive the 24-hr. period between injection and the first blood sugar determination. It is possible that they were unable to withstand the hypoglycemic stage of the effects of alloxan which, according to Jacobs (11) occurs between the initial rise in the blood sugar level and its subsequent elevation. The malnutrition of these rats was thought to be due chiefly to the diarrheas resulting from the incomplete hydrolysis of the lactose and consequent losses of nutrients. There may also have been a factor other than malnutrition operating to decrease the diabetogenic effect of the alloxan, some of which may have been lost with the fluid drawn into the intestinal tract, since the diarrheas were often very severe.

TABLE 2

Summary of response of rats to alloxan

DIET	TIME ON DIET	AVERAGE WEIGHT GAIN FOR PERIOD	RATS INJECTED WITH ALLOXAN	RATS BECOMING DIABETIC		BLOOD SUGAR OF DIABETIC RATS	
				Number	Percentage	Range	Average
	days	*gm.*				*mg./100 ml.*	*mg./100 ml.*
Cornstarch	14–20	60	19	16	84	256–615	427
Sucrose	14	40	12	9	75	235–505	420
Lactose	14–20	−9	17*	3	25	200–465	314
Restricted cornstarch	14	15	13†	4	33	263–588	408

* Five rats died before end of 24-hr. period.

† One rat died before end of 24-hr. period.

There were three instances, two on the cornstarch diet and one on the sucrose diet, in which the blood did not reach a diabetic level by the end of 24 hr.; however, tests on the seventh day showed these animals to be diabetic. In animals that were diabetic within 24 hr. and which survived seven and fourteen days, the blood sugar frequently continued to rise. On the other hand, there were instances in which it decreased, in one case dropping below the level of 200 mg. per 100 ml. blood by the seventh day.

One might speculate as to why undernutrition should result in a decreased susceptibility to alloxan. It seems unlikely that destruction of the insulin-forming cells is less in the undernourished than in the well nourished animal; degeneration may be incomplete in both. It might then be possible that the reduced number of functioning cells could in some instances produce enough insulin to afford protection when metabolic processes are functioning at a low level.

Further observations on a larger number of animals are needed to evaluate these findings better. The question of the extent of the degeneration of insulin-producing cells in rats on the different feeding regimens might be answered by a histologic examination of pancreatic tissues.

SUMMARY

A study was made of the diabetogenic effects of alloxan with rats on diets containing three different forms of carbohydrate: cornstarch, sucrose, and lactose. The highest susceptibility was observed in the rats on the cornstarch diet. There was a slightly decreased susceptibility on the sucrose diet, while the lowest susceptibility was observed on the lactose diet. Restriction of intake of the cornstarch diet decreased susceptibility, indicating that lowered nutritional status was a factor in determining the response of the rats to alloxan.

It is thought that this factor might explain the varied results obtained with the three forms of carbohydrate, since a direct relationship was observed between average weight gains of rats on the different diets and their susceptibility to alloxan. The increased protection observed in the undernourished rats may have been due to a lessened need for insulin and the possibility that the insulin-producing cells that escaped the destructive action of the alloxan were able to meet this need in a number of instances.

Further observations are needed to evaluate the findings of this study better.

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Dibs and Dabs

American Airlines is furnishing its passengers with napkins provided with buttonholes. In a friendly card which introduces the idea, the airline states: "It is quite permissible, in the highest sky society, to shield clothing from unexpected spills by fastening the napkin to the highest button while dining above the clouds." . . . At the **VA Hospital, Wilmington, Delaware,** nourishments are now recorded on large data sheets, three of which are used daily —one for each nourishment delivery. All patients are listed on this sheet according to room location, and the data sheets are placed between pieces of clear plastic, allowing easy reading and preventing soiling. Jane Eastburn, who reports this change, says that the large sheets replace individual 3 by 5 in. index cards which not only were frequently misplaced, but which in addition became quickly soiled, thus requiring rewriting. . . . Stencilled inventory sheets on which all property is listed alphabetically are now being used at **Texas School for the Blind,** Austin, according to Isabelle Gillum Dubar. The sheets provide spaces for amounts, unit prices, and total cost. Formerly inventories were dreaded, for employees of each unit "took off" with pencil and paper and wrote items and amounts as they came to them. The new form provides a systematic method of recording materials and equipment on hand for the accounting department.

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Sylvester Graham—July 5, 1794–September 11, 1851

Sylvester Graham was considered to be an authority in dietetics in his day, but is now largely forgotten except insofar as his name on some grocery shelf may recall something besides crackers and flour to a few inquiring minds. For a brief period in the history of nutrition, he exerted some influence, but many of his ideas were those of the faddist. Some of his teachings were sound, and he did much to popularize the subject of diet. In a day when excessive eating and drinking were common practices, he helped to arouse interest in hygiene and health practices.

Born at West Suffield, Connecticut, on July 5, 1794, Sylvester Graham was the seventeenth and last child of the seventy-two-year-old Reverend John Graham, Jr. His father died when he was two years old and his mother suffered a mental collapse so that he was unrestricted and neglected as he grew up in the care of uncles and older brothers. His education was interrupted by ill health; he worked on a farm for a time, but at nineteen became interested in education, had himself tutored, and became a teacher. His students were enthusiastic about him, but poor health caused him to give this up. At twenty-nine, he went to Amherst and studied hard, and though eloquent and forceful, he was arrogant and made enemies. He had a nervous breakdown and was nursed by Miss Sarah Earl, whom he later married. His expense book records that $3 was paid for the marriage fee and 12½ cents to register the license.

He next decided to become a Presbyterian minister and preached in Newark, New Jersey. He was an excellent speaker, and in 1830, the Pennsylvania Temperance Society appointed him agent to lecture on temperance.

This stimulated his interest in physiology and he bought and studied the standard works of the day. Soon his interest in diet was aroused, and he studied Paris's *A Treatise on Diet* (1826) and became an advocate of temperance in eating. He lectured on diet, chastity, clothing, intellectual and moral faculties, and other subjects and drew crowds in Philadelphia and throughout New York and New England. He became absorbed in questions of diet and promoted vegetarianism. He advocated bread that was at least 12 hr. old and made from unbolted, coarsely ground wheat, and he accused bakers of adulterating their bread. Hence, they and the butchers were violently opposed to this man who wrote and lectured everywhere against them. His followers were predominantly men, often elderly dyspeptics and chronic invalids. Graham boarding houses and restaurants sprang up in Boston, New York, and other cities where his followers could obtain Graham bread and follow his vegetarian regimen.

There were many who ridiculed and persecuted Graham and his followers, and Graham was the butt of jokes and caustic editorials. Vain and convinced that he was right, he brooked no opposition and would not compromise on any of the practices that he advocated. In 1837, at the first meeting of the American Physiology Society (then composed of laymen and before physiology was established as a science), two lecture courses by Graham were supported: one a series of twelve lectures on diet, the other, a shorter course on the Bible doctrine of wine, flesh, meat, and so on. By 1840, Graham's influence began to wane as his followers found him conceited and long winded, and he finally retired to a farm in Northampton where he died September 11, 1851, at the age of fifty-seven.

In 1837 he published *Treatise on Bread and Bread-Making*, and in 1839, his most ambitious work, *Lectures on the Science of Human Life* in two volumes. For many years, this was a basic text on diet and health. In 1837, he founded a magazine called the *Graham Journal of Health and Longevity* which lasted for only three years.

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Current Comment

Mass Feeding Demonstration, Operation Cue—Report of an A.D.A. Representative

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Operation Cue, at Yucca Flats, Nevada, was the first nuclear test activity in the United States to which civilians, other than officials of the Federal Civil Defense Administration and "media" (representatives of press, radio, and television) have been invited as observers. Included in the observers were representatives of more than 150 associations, institutes, and companies. For the Civil Defense Field Exercises alone, there were 450 participants, who carried out the activities of: Sanitation, Mass Feeding, Health, Warden, Police, Fire, Engineering, Rescue, Communications, and the Exercise staff.

As one of two official representatives of The American Dietetic Association, I served as part of the Mass Feeding group and was housed in the desert village, Camp Mercury. Many others—observers and media people—stayed in Las Vegas, 75 mi. away. Each day bus transportation, both from Mercury and Las Vegas, was provided through official channels to the observation area, some 35 mi. distant from Mercury.

Operation Cue was planned to provide seventy-two major experiments in connection with the detonation of a nuclear blast from a 500-ft. tower. Forty-six of these were for the Civil Defense Administration. Many of the results of this operation will provide Civil Defense with facts to use in advising proper safety precautions for civilians. When all data from the tests are assembled, information will be available on the response of the following to nuclear blasts: residential, commercial, and industrial structures and materials; foods and various types of food packaging; shelters, both family and industrial; utilities—electric, gas, telephone, radio, and television; mobile homes; emergency vehicles; radiologic equipment; electrically and diesel-powered sirens; liquefied petroleum gas, storage tanks, and equipment; underground gas distribution systems, connections, and materials; record storage cabinets and safes and their contents—microfilm, paper, ink, and so on.

For this test, Survival City, a town of ten houses similar in type to those found in an ordinary American community, was built to serve as the target. Six houses were one-story structures while four had two floors. Five types of construction were used, including a frame rambler house; a brick masonry house; reinforced masonry; precast, concrete slab; and frame, two-story. Four had basements, while six were set on concrete slabs. The reinforced masonry houses and the concrete slab dwellings conformed to the California earthquake construction requirements and are approved by the Federal Housing Authority. Distance from the blast varied from 4,700 to 15,000 ft. from ground zero.

Eighteen trailer homes were also part of Survival City, nine placed 10,500 ft. from ground zero to learn the damage to be expected in suburban areas of a city. The other nine were in an area of expected fallout.

In our connection with the Mass Feeding group, we were actually concerned only with the feeding of participants and observers. However, as dietitians, Elsie Wells Russell (the other A.D.A. representative) and I, were also interested in learning of the tests of foods placed in the houses, which were conducted under the auspices of the Food and Drug Administration. Ninety foods, selected on the basis of most frequent use and greatest amount in the American diet, were exposed to the blast. Various types of packaging were also tested. Some foods were placed where maximum fallout was expected, in order to indicate resulting problems likely to be encountered. Those buried under a very light covering of earth, and so subjected to neutron and gamma irradiation, will show which foods tend to become radioactive or toxic. To determine the effects of blast and thermal radiation, other packaged foods were placed in exposed areas, and tests will show whether there are any changes in taste, texture, color, or odor after exposure to nuclear blast. A long-range part of the program will be an animal feeding experiment, ranging from six months to two years, in which exposed foods will be tested in the living organism.

Other experiments were designed to test the effectiveness of outdoor underground and aboveground family-type shelters at two ranges, both within the danger zone. Shelters for groups of fifty persons designed for industry were also tested. A biomedical test, sponsored jointly by Civil Defense and the Atomic Energy Commission, will probably show whether persons may be harmed in shelters which show no structural damage. Noise in shelters open at one end was investigated, since the strong winds created by an atomic blast might be sufficient to deafen or disorient the shelter occupants. Shelters built within the houses were also tested. Dogs, mice, rats, and guinea pigs were placed in the shelters to learn the effects of atomic explosion on animals.

Mrs. Russell and I registered at Mercury on Sunday, April 22, four days in advance of the scheduled Shot-Day. That evening and on Monday morning, all participants were "briefed." Lectures included such subjects as "Effects of Blast on Structures," "Results of Field Thermal Experiments," "Fallout," "Background of the Nevada Tests," and "Medical Considerations."

The Mass Feeding group also had its own special preparations to make. The plan was that we would provide coffee and doughnuts preceding the Shot, with breakfast for

all participants and observers after the explosion had taken place. Lunch was to be served on Shot-Day plus 1. On Saturday morning at 7:20, the group assembled and boarded busses for an orientation tour of News Nob and the Observer and Forward Areas. Ample time was provided for inspection of the installations and structures of Survival City. On returning to Mercury, the sixty volunteers of our group were organized into six serving teams and a coffee crew. These teams were to man three service trucks (one team on each side of each truck) equipped with liquid petroleum gas, which would be connected with portable gas stoves. All equipment and supplies for each team were stored on the trucks.

Each team elected its leader, who then organized his serving unit to set up the equipment and prepare and serve the breakfast and luncheon.

The coffee crew was to serve coffee, doughnuts, and candy to observers on Sunday afternoon at a dry-run, and to observers, media, and military personnel during the pre-shot waiting period on Shot-Day and at both the breakfast and luncheon exercises.

On Monday afternoon, preceding scheduled Shot-Day, the Mass Feeding group rehearsed procedure on Observer Hill. "Brunch" for this "dry-run" was prepared under most trying circumstances—a sand storm with winds estimated to reach almost 70 mi. an hour (see Mrs. Russell's report which follows).

So that observers would have coffee and doughnuts before the blast, the busses for the Mass Feeding people were scheduled to depart for the Shot area first—about 12:30 A.M. On the first day of scheduled operation, however, due to a misunderstanding, we sat in our busses and watched hundreds of tanks, armored cars, civilian cars, and observers' busses pass on their way ahead of us. We were the last to arrive, and the coffee crew, which was to have had equipment set up for serving and the coffee ready when the observers and media personnel arrived, was delayed. After considerable confusion over the delay, service was finally established. (Our busses left first, however, on all other mornings, so that hot coffee was ready for the other groups when they arrived.) Just 30 min. before Zero Hour, the Shot was called off. The serving teams, however, prepared and served breakfast as planned, even though the bitter cold wind and near-freezing temperature had driven most observers back into their busses as soon as the postponement had been announced, and they returned to Las Vegas without delay. Therefore, our first breakfast was served only to media and military personnel and the CD Field Exercise participants.

That the test was postponed nine times is well known through national news headlines. The experiences of those who were waiting, however, have not been so well publicized perhaps. After repeated trips to the Shot area (postponement was only once announced well in advance), one reporter stated that "the immediate problem on the wind-swept observation point—Observer Hill, nicknamed 'Horrible Hill'—was not how to survive an atomic explosion, but how to survive watching for one." Participants from Mercury wore not only all their thick woolen garments and combat jackets under coveralls, but came wrapped in blankets from the beds, as did most of the observers.

During the period of postponements, inspection trips to areas of previous shots and to Las Vegas to meet press representatives were arranged for the participants. Also, bus trips to Hoover Dam and Death Valley were offered. Because of the continued postponements, many observers left, as did some of the participants. By actual Shot Day, our Mass Feeding group had dwindled from sixty to twenty-three.

Shot-Day finally came on Thursday, May 5. The Mass Feeding group left Mercury at 12:15 A.M., and the coffee crew served coffee and doughnuts until 30 min. before Zero Hour, at 5:10 A.M.

We had, of course, all been briefed on what to do. We were told to kneel on one knee or to sit —not stand. All wore heavy dark goggles made specially for observing nuclear blasts (the fire ball was calculated to be 1,000 ft. across with a brilliance many times greater than the sun). We were told to count slowly to 5, after the announcer said, "Zero," then cautiously raise the goggles so that the brilliant light would not be too great for unprotected eyes. After the burst, the fire ball increased in size, rose rapidly, and within 4 seconds was followed by a column or stem composed of the vaporized 500-ft. detonation tower and great amounts of earth and other materials funneled into the fire ball, which serve as carriers for the highly radioactive materials. The whole thing took on the appearance of a great mushroom at this point.

We were instructed to count to 8 after removing the goggles, then lower and cover our heads in preparation for the shock wave, a moving wall of highly compressed air. At Observer Hill, this time lapse was about 10 seconds. The shock wave arrived with a loud bang (I did not feel any heat, but did feel and hear the shock wave!). After it had passed, a matter of about a second, we again watched the rapidly rising expanding cloud, about which there was a violet glow. The fire ball lost its brilliance in about 25 seconds and became ice capped as it climbed rapidly into the sky. Then the cloud bent and broke into two "mushrooms." The higher took on a peach-tint as the sun rose. At one time, we thought it was going to pass directly over us, but it was carried by the high winds to the East and North.

After it was determined that there would be no fallout on our location, the serving teams set up the tables, breakfast was prepared and served. Our menu was:

Orange and grapefruit juice
Tomato juice in individual cans
Scrambled eggs Scrapple Bacon
Rolls, butter, marmalade
Coffee Milk

The work of the Mass Feeding unit was not finished with the serving of breakfast following the Shot, however. On Shot-Day plus 1, some of our people went to the Forward Area at 2:30 A.M. to serve coffee to the media personnel who were televising the destruction created in Survival City and to prepare lunch.

For lunch, we practiced survival techniques. At 9 o'clock, a trench about 4 to 6 in. deep was dug large enough to accommodate eighteen 100-lb. lard cans, which were placed on end about 4 in. apart. Roasts of

beef were rolled in salt and pepper, wired to steel bars, and the bars passed through holes punched about 3 in. from the top of the cans, thus permitting the meat to hang in a suspended position. Tightly fitting lids were then adjusted, so that the cans were sealed. Wood rubble from demolished houses and charcoal were placed between and about the cans, canned heat was sprinkled about this fuel, and then ignited. The roasts were cooked for 3 hr. Since it was Friday, we also grilled frozen fillets of cod wrapped in aluminum foil. Our entire luncheon menu was:

Tomato juice in individual cans
Irish beef stew Roast beef sandwich
Fillet of cod
Baked beans[1] Rolls and butter
Ice cream Apple Candy
Coffee Milk

On this Shot-Day plus 1, we were allowed to inspect the effects of the blast on the houses and equipment of Survival City.

At 4,700 ft. from ground zero, a brick and cinder-block house had been completely destroyed. If the mannequins had been living people, all would have perished. However, a steel multiton hydraulic press just behind this house showed little damage, indicating the difference between frame and mortar and solid steel construction.

A rambler-type frame, single-story house had started to burn, then exploded like a geyser. Only the reinforced concrete bathroom shelter had remained intact; two dogs in the shelter were apparently all right. (Animals were used for testing purposes to learn whether, even though a shelter might look all right after a blast, the pressure and flying missiles might kill a human inhabitant.)

The precast concrete slab house without basement stood up under the blast, but the windows and steel window frames were blown out and the furniture was turned over and broken. This house could have been made habitable by replacing window frames, windows, and doors.

At 5,500 ft., a redesigned and reinforced, two-story frame house did not stand up as well as expected. Also, two of the three metal industrial buildings at 6,800 ft. were almost completely destroyed, and at 10,500 ft., two of the test trailers were toppled over. Most windows in the mobile homes were broken and some walls caved in. Civil Defense officials said all could be made habitable with minor repairs for emergency use.

[1] Flown in from Los Angeles.

Photo by Elsie Wells Russell

Roast beef cooking in 100-lb. lard cans

Mrs. Russell's report, which follows this, describes some of the immediately apparent effects of the blast on the foods tested in the houses.

One important lesson was that an open trench shelter can provide the difference between life and death in an atomic attack. It could also be concluded that chances of survival would depend largely on the type of structure people were in at the time of an attack. Civil Defense officials stated that beyond the 1¼-mi. zone, one's chances are good if shelter precautions are taken, but blast effects are noticeable as far away as 3 mi. The greatest danger in houses would be from missiles of glass, Venetian blinds, broken furniture, and so on.

Some protective measures which may be taken are:

(a) Getting as far away from contamination as possible.

(b) Shielding or taking cover, i.e., going into a basement, cellar, foxhole, or trench. Remember that anything dense enough to cast a shadow will provide protection against direct thermal radiation, even sufficient thickness of paper. Also, don't forget that the time between the burst and shock wave would give one time to "duck and cover.".

(c) Decontaminating., i.e., washing with ordinary soap and detergent and water.

(d) Wearing protective clothing, such as coveralls, canvas boots, gloves, and headgear.

Experiences at Yucca Flats for Operation Cue

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and

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Federal Civil Defense Administration

Participants in the Mass Feeding exercise of Operation Cue at Yucca Flats, Nevada, arrived on the desert on April 22, four days before the Shot was scheduled. Appropriately enough, our first glimpse of Camp Mercury, our desert home, was of metal roofs gleaming in the afternoon sun. We soon came to the Security Station, where we produced the necessary papers and received green tags, which we wore at all times thereafter. After being assigned quarters, we picked up at the supply hut the coveralls and helmets which were to become the "unidentifying" mark of the "desert rat" for the next two weeks.

The Women's Dormitory proved to be a former men's quarters. Fifty some women from the nine services of Civil Defense were quartered there.

I was indeed fortunate to have five congenial women as my roommates: two representatives from the American Red Cross and one each from the American Home Economics Association, American School Food Service Association, and International Stewards and Caterers.

The first evening we were briefed by John Hurley, Director of Mass Feeding for the Federal Civil Defense Administration, who explained that the purpose of this first Mass Feeding demonstration was to "utilize resources and facilities from all over the nation." Indeed, persons from every phase of public feeding were present—the widely divergent fields represented ranging from the hotel and restaurant industries to the producers of bottled gas; from veteran handlers of emergencies, such as the American Red Cross, to the manufacturers of paper cups and containers. Our group included millionaire hotel and restaurant owners, some of the top chefs in the country, and trained and professional volunteers.

General briefings for all CD participants were also given that evening, and on the following days.

SHOT-DAY MINUS 3

The next morning, our group was taken to see the Observer and Forward Areas. We were permitted to look, but warned not to touch anything, not to take any pictures, and to stay out of the way of workmen still furnishing the homes and setting up instruments in Survival City.

SHOT-DAY MINUS 2

Further briefings in the form of lectures were held throughout the day. During the afternoon, the special coffee team of twelve went out to Media Hill to provide coffee for observers on tour of the Forward Area.

SHOT-DAY MINUS 1

At 2:30 A.M., we were on the bus being security-checked and were soon on our way to the Forward Area to see and participate in the Dave Garroway TV show. All nine of the CD services were to be represented, but since the food service unit was at the far end of the semi-circle away from the spot where the interviewing began, it was also on the far end of the time limit. Of course, when the show was over, we became very popular with our cups of steaming coffee and doughnuts. We soon "wrapped up" the operation and returned to Mercury, going to bed just as the others were getting up. As a result, we missed one of the most interesting of the briefing lectures, that on the "bounce" of the shock waves.

After very little sleep, at 11 A.M., we once more headed for Media Hill and a "dry-run" for the Mass Feeding project. Three food and equipment trucks, the coffee truck, and the water sanitation truck accompanied us. For the dry-run itself, however, only one service unit (one side of one of the three trucks) was set up, but the rest of the units collected the necessary items for their stations.

The dry-run truly tested our mettle. From the time we arrived, the wind gradually increased until it reached what some called hurricane velocity. In fact, it was so strong that 115 tents at the Army's Camp Desert Rock were blown down. However, we managed. A crew dug post holes, and in a short time, a semi-circular wind break around the serving unit had been erected. So strong was the wind, though, that two of the poles broke.

Three dietitians sampling roast beef cooked during dry-run. Left to right: Dorothy L. Bovee, American National Red Cross; Ruth Hastings, American National Red Cross; and Elsie Russell, A.D.A. representative.

The courageous crew assigned to cook the "brunch" for the feeding team did a superb job in the midst of this sand storm. Perhaps the greatest feat was that of the chef who stirred scrambled eggs while the pan was covered with a lid to keep out the sand.

On returning to Mercury after our dry-run, the main topic of conversation was "Will the blue light be flashing?" The next day was scheduled as Shot-Day; if the bomb was to be detonated as scheduled, a blue light on a pole would be lighted; if postponed, a red light was to flash. As our bus drew near camp, we spotted the blue light. It was hard for us to believe the Shot would be fired in such a wind, but it was explained that the upper winds were of the greatest importance. We went to bed prepared to go out again early the next morning, but after the 10 P.M. weather briefing, we were notified that the Shot was cancelled.

Serving in the midst of a sand storm during dry-run

DAYS OF WAITING

Our days of waiting found us watching for the blue light. Since each night but one it appeared, we regularly got up in the middle of the night, bundled up to protect ourselves from the cold, and went out to the observation area, only to learn shortly before the scheduled Zero Hour of another postponement.

Each day we served coffee, and on one occasion, also served breakfast. That day, instead of being at the first of the convoy, our busses were near the end, which created a classic "snafu." When we arrived at Media Hill, we were quite unpopular, since the observers had been there for some time without coffee and it was bitter cold (32°F.). However, the first round of coffee had already been prepared in 20-gal. thermos jugs, and six stations were soon set up. In short order, the liquid petroleum gas men had burners hooked up to tanks and water was heating for the time when the prepared coffee was exhausted. All coffee served was made with instant coffee powder, and we had many compliments on its flavor. (However, in that cold, I think even hot water would have tested delicious.) Even though we were late in starting, we served some 3,000 cups of coffee that morning.

When the Shot was called off, we debated whether we would serve breakfast as planned. After many pros and cons, it was decided to use one truck with two serving units. Folding tables were unloaded from the wagons, and short order stoves and griddles were set up. The chefs and men helpers prepared the food while the women set up the serving line and helped in the serving. The coffee truck had been purposely parked some distance away so that the line moved to another area for coffee, thus avoiding a jam. Although, because of the cold, most of the observers had started back in their busses to Las Vegas as soon as the postponement had been announced, a few news and television people remained, plus the participants. In all, about two hundred people were served that morning.

During the days of postponement, a number of activities were provided to keep us busy and/or "entertained." On two days we were taken to Las Vegas for press interviews. I twice enjoyed trips to Death Valley, the first just for an afternoon, but the second was an all-day excursion during the one period when we knew in advance that the postponement would definitely be for 48 hr. Others visited Hoover Dam that day. On another occasion, when for many of us our funds were running low, most of the camp went to Las Vegas to get money (personal checks could not be cashed in camp)—not to lose it! Before we returned, we visited many of the famous and widely publicized "spots" of the town.

The day before what actually turned out to be Shot-Day, the Atomic Energy Commission planned one of our most interesting trips. Four busloads were taken to a "Restricted Contaminated Area." We were told that we could say, "We were permitted to walk over a site where an atomic weapon had formerly been detonated and information from this area is classified." Not even newsmen had been there. We were given white canvas "Rad-Safe" boots to wear over our regular shoes. Three times after leaving the area we were Geiger-counted and were taken to the decontamination area and shown how this is done. However, no one was found to be contaminated, and no clothes were confiscated.

An amusing by-play on our frustrated waiting occurred on Sunday, after the Shot had been postponed six times. On returning to Mercury after visiting friends in town, we stopped at the Recreation Hall. There we found attached to everyone's security tag a card with the one word—"Smile." These cards then turned up almost everywhere—on our doors, on the mirrors in the bathroom, on the participants. It was good psychology—and much needed. Not until several days later did someone turn one over and realize that an enterprising hotel man had done a clever bit of advertising.

On Monday, Shot-Day Minus ?, after seven postponements, a special briefing was held. By now our original Mass Feeding group of sixty had shrunk considerably—not that anyone wanted to leave, but many had other important commitments. Seventeen people offered to stay until Friday. If there was no shot by then, it was decided that the Mass Feeding exercise would be cancelled. It then became practically impossible to get to one of the three pay telephones in Mercury, and the telegraph company did a thriving business. For the next two days, approvals and disapprovals for those remaining kept coming in, and I was most happy that mine was an approval to stay.

SHOT DAY

On Thursday, May 5, at 12:15 A.M., our bus departed for the test area as it had almost every day since April 25. The previous evening when we had returned to camp, the weather had been wonderful, the warmest and calmest day thus far and everyone had felt that tomorrow would surely be "The Day." It was.

Our coffee stations were in action soon after we arrived. Demand at the center of activity was so great that a large 10-gal. can with a metal pitcher for dipping and pouring was set up and coffee dispensed from it. We found individual packages of powdered cream and sugar of somewhat questionable value. Although convenient, they were difficult to use if one had a cup of coffee in the other hand, and we soon found ourselves tearing the packages open for the coffee drinkers. For those who could not leave their stations, we provided four "walkie coffees" which circulated.

After the last weather briefing at 4:30 A.M., the announcement "The Shot is on" was made. We were told to adjust our goggles, brace ourselves, and the count started. At Zero Hour the blast was much more impressive than I had expected, and I was so fascinated by the immense boiling black and white cloud mounting rapidly into the sky that I almost forgot to remove my goggles at the 3-second count. I hurriedly pulled them off and was still in time to see the foaming mass of red, purple, and orange, which gradually turned to brown and peach tints. The heat reached us, 7 mi. away, almost simultaneously with the flash; it felt like a quick blast from a hot oven.

My interest in the cloud had also caused me momentarily to forget that I wanted a picture of the bomb. While trying to adjust my camera, the shock wave hit us. This, too, I'd forgotten.

Within 25 min. after the Shot, when we began serving breakfast, we were surrounded by dust. By the time we left the hill, 2 hr. after the blast, all of Yucca Flats appeared blanketed in a thick layer of dust.

The Mass Feeding people had little opportunity to view the awe-inspiring spectacle of the cloud being blown off to the North, for once the Shot was over, everyone began to think of food. We closed our temporary coffee station and hurried down to the feeding stations. With the twenty-three members of our group who were left, we set up two feeding stations and served the same breakfast as before (the menu Mrs. Fehlman has listed) —this time to about a thousand people. The speed of service was amazing, and coordination of the teams was perfect; everyone had an assigned job and did it. The food was delicious, and the Philadelphia scrapple particularly intrigued everyone.

What a difference there was in the morale of our group when once again we "buttoned up" the trucks and climbed into the busses to return to Mercury! We all felt sorry for the thirty-seven of our group who had missed this sobering and frightening experience.

SHOT-DAY PLUS 1

The day after the Shot, we assembled at 4:30 A.M. for our last trip to Yucca Flats. (The service groups, of which we were one, went out early to inspect Survival City before the observers came, so that when they arrived we would be ready to prepare the field lunch.)

Mrs. Fehlman has described the appearance of the town as we saw it that morning.

We were naturally interested in what had happened to the test foods. Half had been heat sterilized and packed in metal or glass, while the other half was composed of staples, such as sugar and flour. Semi-perishables, such as potatoes, and processed meats and perishables, including fresh meats, butter, and frozen foods, had also been subjected to the blast.

Foods on shelves in the kitchen of the house at 5,400 ft. from ground zero, on a wall toward the blast, were scattered over the floor. Some glass containers were broken, some were not. In the basement, a food shelf on the wall—away from the blast—remained intact; the food was not moved even a fraction of an inch.

The cinder block and the reinforced cement houses had stood up well, flying glass being the big hazard, for all windows were

Attired in "Rad-Safe" boots for inspection of previously contaminated area. The author is on the right.

broken. The stove in one of these houses was undamaged and later moved to the cooking area, hooked up to a tank of bottled gas, and made usable. The refrigerator, however, fared less well; the door was badly sprung and havoc was evident. The liquid petroleum gas tanks were found intact, much to the joy of the gas men.

Observers now began to appear and our group gathered at the trucks for instructions. These trucks included the supply, refrigerator, equipment, and water trucks. Mrs. Fehlman has described the roasting of the 15- to 18-lb. sirloin tip roasts in 100-lb. lard cans. Our grill for broiling the aluminum-wrapped frozen fish was made from bricks from a test house. Fifteen min. before serving times, the fish were put on the grill. They seemed very popular. The beef stew was prepared from canned beef, onions, and potatoes, with the juice from the onions used with a powder to make gravy.

At noon, the roast beef came out of the roasting cans and was sliced by the chefs. Our serving line prepared French-dipped sandwiches—one person dipping half the bun in the meat juice, another placing the sliced beef on the other half of the bun. The compliments on the beef were most gratifying, and some asked for two servings. Our two serving lines handled about twelve hundred people.

This was a once-in-a-lifetime experience. We not only witnessed the awe-inspiring bomb and saw the beauty of the blooming spring desert flanked by snow capped mountains molded by purple shadows, we experienced at first hand a demonstration of the cooperative spirit of the American people in action. Everyone who came to this operation came at his own expense or at that of the organization which he represented. Over one and a half million dollars worth of equipment and the food for the Mass Feeding demonstration were donated by American industry. It was truly humbling, if gratifying, to be a part of Operation Cue.

Summing Up Mass Feeding Activities at Operation Cue

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Operation Cue was a thrilling, difficult, and thoroughly unbelievable experience! There were moments when it would have been so easy to give up. Yet, one seemed to get second wind just as the frustrations reached their highest point and our morale the lowest ebb.

When H-moment came, we realized how very much worth while the waiting had been. We saw the magnificent and awesome sight of atomic energy released—a never-to-be-forgotten experience, defying a description with mere words.

On the practical side, our mission was accomplished. In fact, it was accomplished with added dividends. Instead of one coffee service for 1500 people, we gave seven coffee services to 2000 persons. Each time they took us out to the Observation Area, we set up and served, only to be told that "The Shot is postponed." Each time we broke down the station, loaded up the truck, took it back to camp for cleaning and replenishing for the next occasion.

We cooked two breakfasts and a brunch, so that on the final day, we could have set up and served with our eyes closed. An estimated 55,000 cups of coffee were served.

Many helpful lessons were learned: how to forge a group of volunteers (whether professional or non-professional) who have never seen each other into a coordinated team; the need for careful and detailed preplanning of every phase of the operation; the importance of well qualified leadership; the value of practice and experience in working together to acquire speed and efficiency; and above all, the importance of good organization and coordination of all phases of the operation beforehand.

Some of the flaws had their origins in factors over which the feeding group had no control. The "Snafus" for which World War II was famous were present again: orders given and then countermanded; confused reports and rumors; difficult terrain; transportation and communication problems; lack of planned policing facilities; major changes in schedules; great distances to be traversed; supplies and equipment left to chance until the last minute. Then, to add to our frustrations and make the whole thing more complex, nature played its fickle hand.

We had fun—lots of it—and we had a good group. The Mass Feeding demonstration was also good public relations for all organizations in the allied feeding field and surely an education for everyone.

[1] A.D.A.'s present representative on the National Advisory Committee for Civil Defense is Rosemary L. Lodde, Veterans Administration, Washington, who recently accepted this appointment following Miss Bovee's resignation. Miss Bovee remains A.D.A. Chairman of Civil Defense, working with the civil defense chairmen of the state dietetic associations.

Definition of a Dietitian

In the newly revised Supplement 1 of the *Dictionary of Occupational Titles*, official definitions of "Dietitian" and "Nutritionist" are included. They are as follows:

DIETITIAN—applies principles of nutrition to feeding of individuals and groups. Plans menus and special diets to provide required food, energy, and nutrients. Supervises preparation and serving of meals. Maintains food cost controls. Instructs individuals and groups in principles of nutrition as applied to selection of food and prepares educational materials on nutritional value of foods and methods of preparation. Purchases food, equipment, and supplies. Inspects work areas and storage facilities for sanitary conditions.

NUTRITIONIST—applies science of nutrition to promotion of health and control of disease. Instructs auxiliary medical personnel and other allied professional workers on foods and science of nutrition. Advises public and private health agencies on nutritional phases of their programs, engaging in such activities as in-service training and clinic and community services. Participates in surveys concerning nutrition, gathering such information as food case histories.

Copies of this Supplement 1, which also includes definitions of the "Administrative Dietitian," "Teaching Dietitian," "Therapeutic Dietitian," and "Research Nutritionist" may be obtained from the Government Printing Office for $1 a copy.

Current Literature

Contributed by Mildred Bonnell and administrative dietetic interns, University of Washington, Seattle; Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Marjorie Cheney, Dietetic Intern, VA Center, Los Angeles; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

THE AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 22, April, 1955

*Vitamin B_{12} in neuro-metabolism. M. B. Levin.—p. 96.

Vitamin B_{12} in Neuro-Metabolism. Vitamin B_{12} injected intramuscularly in large quantities is the most active stimulant to neuro-metabolism encountered to date. The effect is noticeable to all parts of the nervous system from the central cerebral to terminal neuritic. The same dose has been found ineffective orally in adults and children. Between 5,000 and 10,000 mcg. injected intramuscularly two to three times a week has been an effective dosage.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 229, April, 1955

*The effects of an adrenergic blocking agent, Regitine, upon the glucose tolerance curve in peptic ulcer patients. M. H. Edwards and T. K. Rathmell.—p. 392.

Use of whole protein supplement as an adjunct to insulin coma therapy. J. D. DeMott.—p. 774.

Carbohydrate Metabolism in Peptic Ulcer. Whether abnormality in the carbohydrate metabolism of ulcer patients could be linked to the adrenal stress syndrome was the subject of investigation. A study was done on the effect of an adrenergic blocking agent, Regitine, on the glucose tolerance curves of peptic ulcer patients and normal individuals. No confirmation of the previously reported abnormality was obtained, and the glucose tolerance tests were not significantly different from those of the normal person. A slight hyperglycemia was produced by Regitine in both ulcer patients and normal controls, the mechanism of which is not understood.

THE AMERICAN JOURNAL OF NURSING

Vol. 55, May, 1955

*Mealtime on the pediatric ward. N. J. Sittig.—p. 551.

Mealtime on the Pediatric Ward. A child's habits are disturbed naturally when he is ill and in the hospital; however, other things, such as the strange people and unfamiliar foods may frighten him and cause him to refuse to eat. Other factors, such as poor eating habits developed at home, are also obstacles. The nurse must first develop a relaxed, calm attitude when feeding children. If she is anxious, she must not show it, and she must not demand that the child eat; rather, she should try to inspire him to do so. Problems with babies under three months are many. However, a relaxed, unhurried attitude generally works in getting small infants to take their formula. When a child is about a year or eighteen months old, his appetite becomes noticeably smaller, because his growth slows down. Food should be in small quantities with more available. Easy-to-handle foods, such as carrot sticks and small sandwiches, are good for the child learning to eat by himself. Group influence begins early, and most children enjoy eating with others. This is also important to the older child, who can be helped by some teaching of the nutritive value of foods.

AMERICAN JOURNAL OF PHYSIOLOGY

Vol. 180, February, 1955

*Fat metabolism in three forms of experimental obesity. Body composition. M. W. Bates, S. F. Nauss, N. C. Hagman, and J. Mayer.—p. 301.

Fat Metabolism in Experimental Obesity. Increased fat content accounts for more than 90 per cent of the increased weight of obese animals in experimental obesity. The fat accumulated in obesity is chemically dissimilar to that of nonobese animals. The most striking differences were the lower protein content and the greater body cholesterol content of the young and mature obese hyperglycemic mice.

THE AMERICAN JOURNAL OF PSYCHIATRY

Vol. 111, April, 1955

*Use of whole protein supplement as an adjunct in insulin coma therapy. J. D. DeMott.—p. 774.

Whole Protein with Insulin Coma Therapy. Delayed adverse reactions, such as prolonged coma, nausea, vomiting, or inability to consume a meal, have been the constant problem in insulin coma therapy. To reduce these reactions, a study was done using a whole protein supplement plus supplementary vitamins and minerals to interrupt the coma and as feeding throughout the day. The results were favorable but not conclusive due to the small number of subjects. Adverse reactions were reduced approximately by one-half; this was especially noted in the afternoon and early evening. The patients themselves greatly preferred the protein supplement to a dextrose solution.

ANNALS OF INTERNAL MEDICINE

Vol. 42, March, 1955

*The effect of levo-thyroxine, dextro-thyroxine, and levo-tri-iodo-thyronine on the electrocardiogram in myxedema: preliminary report. P. Starr and R. Liebhold-Schueck.—p. 595.

*An evaluation of the effect of choline and inositol on the clinical course and serum lipids in patients with angina pectoris. R. S. Jackson, C. F. Wilkinson, Jr., L. Meyers, M. S. Bruno, and M. R. Benjamin.—p. 583.

Thyroxine and Thyronine Therapy in Myxedema. In several cases of patients with myxedema who were treated with levo-thyroxine, dextro-thyroxine, and levo-tri-iodo-thyronine, electrocardiograms began to change toward normal and occasionally became normal before the serum protein-bound iodine or metabolic rate became normal. Dextro-thyroxine had a more marked effect on the electrocardiogram than the levo- or tri-iodo forms.

Choline and Inositol in Angina Pectoris. Forty patients with angina pectoris were studied to test the effect of a choline-inositol sirup on their symptoms and on the level of their plasma lipids. No statistically significant, symptomatic improvement could be demonstrated. The mean levels of plasma cholesterol and phospholipid were significantly higher during therapy with choline inositol. Fluctuations of plasma cholesterol and phospholipid were not significantly affected by the treatment.

THE BRITISH JOURNAL OF NUTRITION

Vol. 9, No. 1, 1955

*Energy utilization in overfed thin young men. R. Passmore, A. P. Meiklejohn, A. D. Dewar, and R. K. Thow.—p. 20.

*An analysis of the gain in weight of overfed thin young men. R. Passmore, A. P. Meiklejohn, A. D. Dewar, and R. K. Thow.—p. 27.

*Food preparations used in weaning urban Bantu infants. A. R. P. Walker, D. C. Fletcher, E. S. P. Strydom, and M. Anderson.—p. 38.

Weaning Urban Bantu Infants. The diet of urban Bantu children under two years of age was studied. The food mixtures included cereal paps, proprietary mixtures of cereals and dried milk, and preparations of dried milk. Samples of the foods were analyzed for total solids, protein, fat, and ash. The investigation showed that, in general, food mixtures were too much diluted. Except for the thick cereal paps given to the older children, the mixtures were almost invariably inadequate in calories, and the thin cereal paps, the proprietary cereal and dried-milk foods, and the miscellaneous foods were usually too low in protein concentration. It is stressed that the instructions given with commercial infant foods often permit the total solids in the liquid food to vary by as much as 30 per cent.

Energy Utilization in Overfed

Thin Young Men. A study was made of the metabolic changes in underweight but otherwise healthy young men fed beyond their requirements. The three subjects were confined to bed for the greater part of the day to cut down their energy expenditure, to increase the excess intake of calories, and to facilitate the measurements of their energy expenditure. A measured and controlled amount of exercise was permitted to prevent the physical deterioration that accompanies total confinement to bed. The men were fed on diets from 1300 to 1600 calories in excess of requirements for periods of ten to fourteen days. Energy expenditure was determined by indirect calorimetry at 4-hr. intervals throughout 24-hr. periods. There was no evidence that any of the excess food was oxidized, apart from a small amount due to the rise in metabolism attributable to the specific dynamic action of the extra protein ingested. Fecal analyses showed that over 90 per cent of the excess food was absorbed.

Weight Gain in Overfed Thin Young Men. The weight gain of the three young men discussed above was less than three-quarters of that which should have been expected had the excess dietary calories been used to make "obese tissue" composed of fat, cellular material, and extracellular fluid. The nature of the material responsible for the gain was investigated by measuring the balances of energy, nitrogen, water, sodium, and potassium. Analysis of nitrogen and energy balances indicates that the whole of their gain in weight was due to the deposition of chemical substances: fat and protein. There was no evidence of any water retention. The authors conclude that, over short periods at least, the healthy human body can respond to overfeeding by simply concentrating itself, by increasing the concentration of fat and protein within the existing cells. The study, however, still fails to answer the question of how the subjects manage to keep themselves thin. The authors present the question of whether there is some metabolite, rapidly produced, that controls our food intake.

BRITISH MEDICAL JOURNAL

No. 4917, April 2, 1955

*Ineffectiveness of chicken anti-ulcer factors in treatment of gastric and duodenal ulcer in man. K. Brøchner-Mortensen, N. B. Krarup, E. Meulengracht, and A. Videbaek.—p. 818.

Chicken Anti-Ulcer Factor. This study was undertaken to determine whether material acting prophylactically against gizzard ulcer in chicks has any curative effect in gastric and duodenal ulcer in man. Eighty-two patients were studied and given "anti-gizzard-ulcer factor," which is an ether extract of calf's brain plus vitamin B_{12}. The experimental and control groups did not differ in their response to treatment.

THE BULLETIN OF MATERNAL WELFARE

Vol. 2, January-February, 1955

*Food practices of obstetric patients. G. G. Smith, C. F. MacKinnon, and A. Molleson.—p. 7.

Food Practices of Obstetric Patients. A study of the food practices of obstetric patients from rural and urban homes in North Carolina unable to afford the services of a private physician resulted in the following suggestions for improvement of nutritional intake: (a) increased intake of protein; (b) decreased intake of (salted) fat, carbohydrate, and sodium; and (c) increased vitamin and mineral content of the diet. The study showed that protein sources are limited. Dried beans and peas are used almost daily, eggs eaten at breakfast, but the milk intake is low. Purchase of lean meat is restricted by income. Sources of energy include biscuits and cornbread; sweets, such as molasses, jam, and jelly; and candy and carbonated beverages. The use of pork fat for seasoning vegetables and for frying purposes assures a high-fat intake. Fresh fruits when available are valued as snack foods. Frozen and dried fruits are little used. Vegetables are limited in variety but those used, such as "greens," cabbage, tomatoes, and sweet potatoes, are of high nutritive value. Raw tomatoes and cabbage are widely used when in season.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 72, April 1, 1955

*Ascorbic acid content of human arterial tissue. G. C. Willis and S. Fishman.—p. 500.

*Vagotomy in the treatment of peptic ulcer. (With an analysis of results in almost 650 cases). A. D. Beattie.—p. 510.

Vol. 72, April 15, 1955

Diseases of the gallbladder: their nature and classification. M. R. Abell.—p. 565.

Ascorbic Acid in Arterial Tissue. A gross and often complete deficiency of ascorbic acid frequently exists in the arteries of apparently well nourished autopsy subjects. Old age seems to accentuate the deficiency. The ascorbic acid depletion is probably not nutritional, but rather related to the stress of fatal illness. Local depletion often exists in segments of arteries susceptible to atherosclerosis for reasons of mechanical stress.

Vagotomy and Peptic Ulcer. Vagotomy has now been shown to be the operation of choice for chronic duodenal ulcer and to be of considerable value in certain types of ulceration. The original enthusiasm with which this operation was greeted has proved entirely justified.

DIABETES

Vol. 4, January-February, 1955

*Nutritional management of children with diabetes mellitus. S. N. Wilkens, D. O. Ruby, H. G. Kelly, and R. L. Jackson.—p. 24.

Nutritional Management of Diabetic Children. A study of caloric intakes of seventy-one juvenile patients with diabetes who sustained normal growth is presented. This information was taken during childhood and adolescence. Curves based on the mean and standard deviation of total calories per day for varying age groups and the mean calories per pound of theoretical body weight have been derived from these data and may be used as a general guide for caloric requirements for children and adolescents. A comparison of the nutritive value of the diabetic diets with the 1953 Recommended Dietary Allowances illustrates that, even though caloric intakes in general are lower than those recommended, the diets provide more liberal amounts of protein, calcium, vitamin A, and riboflavin. The maintenance diet for the diabetic child should be essentially the same as for the well-fed normal child; and in the opinion of the authors the diet should be planned quantitatively, with foods given at specific periods during the day. The diet should be individualized to meet the varying needs of growth, physical activity, and maturation pattern of each child. Inasmuch as it is impossible to maintain complete diabetic control at all times, a slightly higher intake of protective foods is advised to provide some margin of safety.

ENDOCRINOLOGY

Vol. 56, April, 1955

*Role of iodine deficiency in the production of goiter by the Remington diet. A. A. Axelrod, C. P. Leblond, and H. Isler.—p. 387.

Iodine Deficiency by Remington Diet. The Remington diet, which consistently produces thyroid enlargement in rats and mice, was examined systematically to determine whether it contained any factor other than deficiency in iodine that could be responsible for goiter production. Of all the foodstuffs comprising the diet, only sodium chloride appeared to play an important role in goiter production. Further investigation proved that sodium chloride ingestion did not produce goiter in the absence of iodine deficiency.

FOOD AND NUTRITION NOTES AND REVIEWS (AUSTRALIA)

Vol. 11, November-December, 1954

*A discussion of dietetic and nutritional factors in relation to dental caries and of difficulties in effecting changes in food habits. H. R. Sullivan and N. E. Goldsworthy.—p. 113.

Diet, Nutrition, and Dental Caries. It has been observed that children living at Hopewood House, Bowral, Australia, and eating a diet of: vegetables, raw and cooked; salads; fruits, fresh and dried; whole meal cereals and whole meal bread; milk, butter, and concentrates of vitamins; and a sufficient intake of protein through free use of milk, cheese, soya bean, and egg, are remarkably free from dental caries. Children of the same age group in the general population, whose diet includes white bread and jam, cakes, pastries, sweets, and ice cream, have ten to twenty times as many decayed and filled teeth. This seems to justify the claim that there is a close relationship between the ingestion of large quantities of refined carbohydrates and the prevalence of dental caries. Apparently freedom from caries can be obtained by any person prepared to adjust his dietetic habits so that the carbohydrate intake satisfies nutritional requirements and is obtained from the

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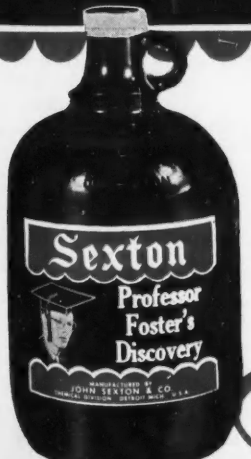

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products of whole meal flour and other cereals and carbohydrates in their natural state. There are, however, many prejudices which make dietary changes extremely difficult; these include ignorance, cultural patterns, desire for freedom of choice of food, and the innate human liking for sweetness. It is also stated that eating between meals may be an important factor in dental caries.

FOOD RESEARCH

Vol. 20, March-April, 1955

*Nutrient composition of Cuban foods. 1. Foods of vegetable origin. J. M. Navia, H. Lopez, M. Cimadevilla, E. Fernandez, A. Valiente, I. D. Clement, and R. S. Harris.—p. 97

*Studies on canned cheese spread experimentally inoculated with spores of *Clostridium botulinum*. R. O. Wagenaar and G. M. Dack.—p. 144.

*The effect of different methods of cooking beef round of Commercial and Prime grades. 1. Palatability and shear values. R. M. Griswold.—p. 160.

*The effect of different methods of cooking beef round of Commercial and Prime grades. 2. Collagen, fat and nitrogen content. R. M. Griswold. —p. 160.

Composition of Cuban Foods of Vegetable Origin. One hundred and fifteen samples of foods of vegetable origin were collected in different parts of Cuba in 1953 and analyzed for: moisture, ether extract, crude fiber, nitrogen, ash, calcium, phosphorous, iron, carotene, thiamine, riboflavin, niacin, ascorbic acid, tryptophan, methionine, and lysine. The results are presented as well as botanical descriptions of the different samples; their Spanish, English, and scientific names; and descriptions of the foods and dishes in which they are consumed.

Bacterial Study of Canned Cheese Spread. Sixteen lots of cheese spread were prepared and stored at 90°F. for intervals up to six months. Half of the samples were cheese force-cured for four months, and the remainder were month-old cheeses. These cheese spreads were processed to contain approximately 36 per cent moisture, to have *p*H levels varying from approximately 5.2 to 6.2, and salt concentrations of about 1.25 or 2.50 per cent. No botulinum toxin was demonstrated in any inoculated samples. Counts from the inoculated lots showed that approximately half of the inoculated spores were recovered at the initial analysis and that there was a gradual decrease in these counts during storage. All samples contained viable spores at the end of the storage period.

Palatability of Beef Rounds. The effects of fourteen cooking methods on palatability and shear values were compared with a standard braising method using beef round of Commercial and Prime grades, and top and bottom muscle. Standard braising was preferred to braising under pressure. The application of enzymes before braising made the meat more tender but less juicy than the standard method. Pounding, but not scoring before braising increased the tenderness of beef round. Soaking in vinegar failed to increase tenderness and lowered acceptability of the meat. Beef round roasted at 250°F. scored high in flavor and acceptability and had lower shear values than meat cooked by many other methods. Meat roasted at 300°F. was superior only in juiciness to that roasted at the lower temperature. The standard braising method is recommended for cooking beef round. The meat may be pounded or treated with papain before braising to increase tenderness. Roasting at 250°F. is a superior method except for the dry appearance of the surface. No significant differences were found in the palatability or shear values of beef from the top and bottom muscles in the round. Palatability scores were, on the whole, higher and shear values lower for beef of Prime than of Commercial grade.

Collagen, Fat, and Nitrogen of Beef. The collagen content of meat, and moisture, fat, *p*H, total nitrogen, and free amino nitrogen of meat and drippings were determined for beef round of Commercial and Prime grades cooked by fourteen methods and compared with a standard braising method. The more soluble nitrogenous constituents went into the drippings, but the total amount of free amino nitrogen did not increase during cooking. The collagen content of cooked beef was significantly higher for Commercial than for Prime grade, but was not significantly different for the top and bottom muscles of the round. The average collagen loss on cooking by all methods was 61 per cent. Losses of collagen increased as the internal temperature of the meat increased and were greater when the meat cooked under 10 or 15 lb. per square inch pressure than at 5 lb. or by the standard method. Collagen losses were higher in meat roasted at 250°F. than at 300°F. or braised by the standard method and were especially high in meat soaked in vinegar. In meat braised without added water, collagen losses were lower than for any other method. Treatment of the meat before cooking by pounding, scoring, or the use of enzymes had little effect on collagen loss.

GASTROENTEROLOGY

Vol. 28, April, 1955

*Alterations in serum diastase and albumin values in protein deficiency. J. F. Sullivan, R. J. Healey, and W. A. Knight, Jr.—p. 550.

*Effect of a carbonic anhydrase inhibitor, Acetazoleamide, upon gastric secretion in man. Report of its use separately and in conjunction with anticholinergic drugs. E. C. Texer, Jr. and C. J. Barborka.—p. 519.

The mechanism of vagal stimulation of gastric acid secretion. L. Pevsner and M. I. Grossman.—p. 493.

Comparative effects of Pamine, Banthine, and placebos on gastrointestinal motility. 1. Radiographic study in eight adult subjects tested when fasting and after three weeks' administration of agents. W. P. Chapman, S. M. Wyman, J. O. Gagnon, J. A. Benson, C. M. Jones, and C. Sexton.—p. 500.

Comparative effects of Pamine, Banthine, and placebos on gastrointestinal motility. 2. Radiographic study in eight adult subjects tested when fasting and following the administration of a standard meal. W. P. Chapman, S. M. Wyman, J. O. Gagnon, J. A. Benson, C. M. Jones, and C. Sexton.—p. 510.

Protein and Pancreatic Function. The relationship between protein metabolism and pancreatic function has not been completely established. Six patients with malnutrition and pancreatic disease were selected in an attempt to demonstrate the relationship between protein deficiency, morphologic pancreatic and hepatic changes, and abnormal serum diastase and albumin values. The patients all exhibited low serum diastase and albumin levels. These values returned toward normal following treatment which included a high-protein, high-calorie, and high-vitamin intake. Low serum diastases were found to correlate with severe pancreatic disease. In patients with ulcerative colitis with inadequate protein intake and excessive loss by diarrhea, malnutrition may have been an etiologic factor in the pancreatic abnormalities.

Carbonic Anhydrase and Gastric Secretion. Evidence indicates that carbonic anhydrase plays an important role in the formation of hydrochloric acid and, therefore, that inhibition of this enzyme should decrease hydrochloric acid production. This study was done to determine whether a carbonic anhydrase inhibitor would exert any inhibitory effect of gastric secretion in man following oral administration. In dosage of 1 gm. per 24 hr., it was found to exert a significant inhibitory effect without influencing the volume of gastric secretion. Pro-Banthine and Pathilon also exhibited inhibitory effects on hydrochloric acid production. This study does, however, support the theory that carbonic anhydrase in the parietal cell has an important role in the process of acid secretion in the stomach.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 158, May 7, 1955

*Candy medication and accidental poisoning. Council on Pharmacy and Chemistry.—p. 44.

Danger from candy medication. Editorials and Comments.—p. 48.

*Minerals in food supplement tablets. Queries and Minor Notes.—p. 92.

Vol. 158, May 14, 1955

*Amino acid metabolism and mental deficiency. Editorials and Comments.—p. 122.

*Restrictive diets. Editorials and Comments.—p. 123.

*"Spot" weight reduction. Queries and Minor Notes. —p. 150.

Candy Medication and Accidental Poisoning. Today, antibiotics, antiepileptics, antihistaminics, barbiturates, sulfonamides, salicylates, and vitamins are available as candy medications to promote greater cooperation among sick children. Some pediatricians, however, have not adopted the use of these fine-flavored remedies because they consider them potentially dangerous and unnecessary. Statistics on morbidity and mortality from poisoning in the U. S. are not sufficiently comprehensive and explicit to indicate the full influence of candy medication on accidental injury and death in children. Reports on aspirin are presented. Although these reports do not represent conclusive evidence, they strongly suggest that flavored aspirin has contributed to an increase in accidental poisoning disproportionate to its availability. The A. M. A. Committee on Toxicology warns of the dangers of potent drugs in candied forms. The

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present casual attitude toward these products must be corrected, especially when it leads to indiscriminate use and careless storage. The public should be informed and constantly reminded that many of these products that are packaged and flavored to look like candy are in reality potent drugs, some of which can be dangerous with overdoses.

Minerals in Food Supplement Tablets. In answer to a question about the beneficial and harmful effects that may result from use of minerals in food supplement tablets, the following is stated. Iodine, iron, and calcium are well known and important nutrients for man and usually will be supplied in sufficient amounts by a normal diet but should be used specifically only in the prevention or treatment of the disease states for which they are indicated. The best evidence at present would indicate that there is sufficient copper, magnesium, manganese, zinc, cobalt, nickel, and molybdenum in the normal diet, but the evidence is scanty. Conversely, there is no evidence of deficiency of these substances in man and, as their possible toxicity is unknown, it would seem wise not to administer them apart from the quantities contained in a normal diet.

Amino Acids and Mental Deficiency. It has been suggested that the mental defect in phenylpyruvic oligophrenia is due to intoxication by the accumulated phenylalanine or by an unidentified metabolite. Recent reports from England tell of improved mental status in four such patients placed on a diet low in phenylalanine. Patients receiving this diet for two to ten days showed no phenylpyruvic acid in the urine and developed apathy and weight loss. Milk was then added as a source of phenylalanine, the amount given being slightly less than that causing phenylpyruvic acid to appear in the urine. On such a diet, patients gained weight and maintained normal hemoglobin values. Subjective evidence of mental improvement was noted in all patients, and, in three, objective evidence of improvement was obtained by means of psychometric studies.

Restrictive Diets. Restrictive diets have been used in the treatment of obesity, gout, skin diseases, gallbladder diseases, nephritis, polycythemia vera, gastrointestinal diseases, and other conditions. If a psychosomatic element is present, a difficult or unattractive diet may aggravate the emotional disturbance and defeat the therapeutic regimen. The chief difficulty with restrictive diets is that they are monotonous and do not satisfy the patient's appetite. Rittelmeyer urges the physician never to prescribe a restrictive diet unless he has first tried it himself and understands the difficulties which may arise in trying to follow it. If a restrictive diet must be prescribed, it is not enough to give the patient a list of foods he must avoid. He must be given verbal and explicit instructions regarding the method of preparation of the foods permitted, suggested menus, and instructions to be applied when he is eating away from home.

"Spot" Weight Reduction. In answer to a question on whether it is possible to reduce the hips, thighs, and buttocks, it is stated that there is no physiologic basis for the assumption that such "spot" reduction is possible. Only through continued perseverance in a general weight reduction program can the individual hope to affect the areas mentioned. Fat accumulations in such regions are the last to be reduced. Part of the problem may be an inherited tendency to have deviations in body structure or to follow a "stocky" pattern. The patient should be advised against trying the various mechanical devices advertised widely. Sometimes, gentle manual massage following a weight reduction program is helpful in restoring elasticity to the sagging skin.

THE JOURNAL OF PEDIATRICS

Vol. 46, April, 1955

•Celiac disease—what is it? L. E. Holt.—p. 369.

Vol. 46, May, 1955

•Influence of type of feeding on pH of stool, pH of skin, and incidence of perianal dermatitis in the newborn infant. A. G. Pratt and W. T. Read, Jr.—p. 539.

•Hypoproteinemia and edema in eczema. A. Nisenson.—p. 544.

Celiac Disease. There is little agreement as to what a "celiac" diet is. In this country, it depends on whom one follows—the advocates of the banana, the advocates of fat restriction, or those who stress restriction of certain forms of carbohydrate. Two types of therapy can be used in treating the celiac child—the therapy of use and the therapy of avoidance of foods believed to be the causative agents. The therapy of avoidance can be harmful in some cases and much more is to be expected from the therapy of use. If we are dealing with a food allergy, the "therapy of use" does not apply, or, at least it requires qualification. It would seem unnecessary to exclude either fats or sugars. No one questions the need of adequate protein and vitamins. Sensitivity to particular foods needs to be studied carefully in every case and only those starchy foods excluded in which sensitivity to the associated protein has been clearly demonstrated. It would seem that the cereal grains and particularly wheat should be used with caution.

***p*H of Feces.** One hundred-forty babies were breast fed, fifty were fed a prepared formula approximating breast milk composition and containing only lactose as carbohydrate, and sixty-one received an evaporated cow's milk and maltose-dextrin formula. During the first three days of life there was little difference in mean *p*H of the stools, regardless of feeding. From the fourth day, *p*H of the stool and of the perianal skin became increasingly acid for the breast-fed infants and for those fed simulated human milk, but remained relatively unchanged for those receiving the cow's milk formula. The *p*H of the axillary skin became more acid with age, regardless of feeding. The incidence of perianal dermatitis varied with the *p*H of the stool and of the perianal skin, being less frequent the more acid the stool and perianal skin. These findings support the belief that the *p*H of the feces of infants is directly affected by the type of feeding.

Hypoproteinemia and Edema in Eczema. Twenty out of twenty-four patients with eczema had evidence of hypoproteinemia, and eight gave clinical evidence of edema. The factors predisposing to edema were extensive "weeping" of skin, a diet poor in animal protein, and infection. In an extensive eczema, particularly where soybean milk is used exclusively, meat should be introduced at an early age. Treatment consisted of amino acid feedings, high animal protein diet, and Amigen, plasma, or blood intravenously. Eighteen patients showed abnormally low albumin levels and five low globulin levels. A much lower serum protein was necessary to produce edema in children under one year than in those over one year.

THE MILBANK MEMORIAL FUND QUARTERLY

Vol. 33, April, 1955

•Nutritional status of industrial workers. 2. Effects of education, age, income, and ethnic groups. M. J. Babcock, H. N. Church, and L. O. Gates.—P. 137.

Nutritional Status of Industrial Workers. Although slight differences in nutritional status observed in this study were attributed to effects of educational level, age, and income, the dominant trend was for evidence of suboptimal nutrition, and also obesity, to be widely distributed throughout all education, age, income, and ethnic groups. The practical implications of these findings are that nutrition programs should be directed to all workers, rather than to certain groups. The samples in this study were selected to be comparable, so far as possible, with respect to other variables likely to influence nutritional status. Comparisons were made of dietary intakes, blood levels (vitamin A, carotene, ascorbic acid, and hemoglobin), physical signs frequently associated with malnutrition, and arbitrary ratings based on a combination of these three kinds of data for each subject. Longer schooling slightly improved the nutritional status, as measured by dietary calcium and phosphorus intakes and serum ascorbic acid. Age appeared to have little effect on the nutritional status, except for a slight decrease in thiamine intake and increase in gingivitis with increasing years. Low family incomes were associated with low calcium intakes and poor ascorbic acid nutriture.

NEW ENGLAND JOURNAL OF MEDICINE

Vol. 252, April 21, 1955

•Comparison between weight reduction on a high-calorie, high-fat diet and on an isocaloric regimen high in carbohydrate. S. C. Werner.—p. 661.

Weight Reduction. A study of the effect on weight reduction of a high-fat, low-carbohydrate diet providing 2870 calories and of an isocaloric high-carbohydrate, low-fat diet is presented. No difference in weight loss between the two diets was observed in two male sub-

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jects; slight differences were noted in three women and one man, but could be readily accounted for by variations in salt and water balance. Weight loss may occur with diets containing more calories than those generally considered as low caloric; greater individualization of the caloric level employed in low-caloric regimens is suggested.

NUTRITION

Vol. 9, Spring, 1955

*Early mixed feeding for infants. B. Gans.—p. 8.
*Antibiotics and nutrition. J. S. Willcox.—p. 20.

Early Mixed Feeding for Infants. The case for early mixed feeding for infants is presented. Modern research into the physiology of digestion in infants and children has proved older theories wrong about their supposed inability to digest and assimilate various food substances. A normal baby can utilize carbohydrates and protein no less well than an adult, and though fat digestion differs, it is still efficient. Infants have strong food likes and dislikes from an early age, are much affected by the appearance of food, and get bored if a food is offered too frequently. They like variety, both of taste and texture. One investigator showed that children coerced into eating what they do not like tend to be conforming, fearful, repressed, inhibited, and unhappy, whereas those not coerced are well adjusted. The author states that on physiologic, psychologic, medical, and practical grounds, infants should be started on a mixed diet containing cereal, vegetables, meat or fish, eggs, cheese, and fruit during their first month of life, irrespective of weight. This holds good also for premature infants once they have left the hospital and for infants recovering from illnesses.

Antibiotics and Nutrition. The incorporation of antibiotics into the diet of young pigs and poultry will enable them to achieve optimal growth. Antibiotic supplements result in increased food consumption and increased efficiency of food conversion. Maximum effect occurs with young animals, and the use of antibiotics is recommended with pork and bacon pigs and with chicks intended for table poultry up to four or five months of age. Antibiotic feeding does not appear to affect the grading or curing of carcasses, and antibiotics do not appear in detectable amounts in the tissues unless amounts are fed far in excess of those commonly recommended. Use of antibiotics can in no way compensate for nutrient imbalance in the diet or nutrient deficiency, however, and they cannot be regarded as a substitute for good hygiene and careful management.

NUTRITION REVIEWS

Vol. 13, April, 1955

*Some aspects of nutrition in Yugoslavia. J. Brozek and E. Ferber.—p. 97.
*Vitamin B_{12} concentration in serum of patients with pernicious anemia.—p. 100.
*Malnutrition and antibody formation.—p. 108.

Nutrition in Yugoslavia. Conditions leading to the present state of nutrition in Yugoslavia are mentioned. War ravaged the country, disrupting the farming, reducing the cattle, and creating difficulties of food supply. Now the medical aspects of food and nutrition are under the supervision of the regional Institutes of Hygiene. Since nutritional problems vary a great deal in the different republics (states) of the country and even within the republics, the Institutes in the individual regions have the responsibility and unique opportunities for examining the broad impact of variations in nutrition on health and disease and for suggesting remedial measures. Several of the studies which have been made or which are now being conducted are mentioned briefly.

Serum Vitamin B_{12} in Pernicious Anemia. In comparison with the values in normal persons, none of the samples of serum obtained from patients with pernicious anemia before treatment contained free vitamin B_{12}. Total serum vitamin B_{12} was reduced in all samples. Values for patients with pernicious anemia after treatment indicated serum concentrations of total vitamin B_{12} similar to those of normal subjects. No explanation was found for the relatively high values for total serum vitamin B_{12} observed in some patients with cirrhosis of the liver. Observations also failed to demonstrate a defect in binding of the vitamin by proteins in serum of patients with pernicious anemia.

Malnutrition and Antibody Formation. Studies with rats have shown that in severe protein deficiency, antibody production is diminished. Also, deficiencies of pantothenic acid, pyridoxine, and folacin severely impair the ability of the rat to make antibodies, whereas deficiencies of riboflavin, biotin, thiamine, vitamin A, and niacin produce only moderate impairment. Deficiencies of vitamins B_{12} and D are without effect on antibody formation. Few studies have been made with human beings. One used wounded men of the Korean War who were suffering severe inanition secondary to paraplegia, tetraplegia, or because of delayed wound healing. Purified diphtheria toxoid was used as the antigen. Although the wounded men had lower than normal serum albumin values, there was no apparent relationship between the capacity to produce antibodies and serum albumin, globulin, or total serum protein level. The age of the patient, clinical condition, or degree of malnutrition did not appear to be related to the antibody response. The only significant relationship was a general tendency for the amount of antitoxin produced to be related to the amount of pre-Schick circulating antitoxin.

PROCEEDINGS OF THE NUTRITION SOCIETY

Vol. 14, No. 1, 1955

*Mineral metabolism in alimentary disease. D. A. K. Black.—p. 50.
*Food allergy. J. A. Milne.—p. 54.
*The diets of elderly women living alone. A. H. J. Baines and D. F. Hollingsworth.—p. 77.

Mineral Metabolism in Alimentary Disease. Both in acute and chronic alimentary disease, disturbances of mineral metabolism are multiple and often interrelated. Acute disturbances tend to impinge mainly on extracellular fluid, whereas chronic disturbances involve cellular and skeletal minerals as well. Potassium metabolism is affected by both types of disturbance. Treatment of mineral depletions should be based as far as possible on quantitative assessments, and some priority should be given to treating extracellular-fluid depletion, as other deficits can only be safely corrected when circulation and renal function are adequate.

Food Allergy. The immunologic basis and clinical picture of food allergy are discussed briefly. The problems presented in diagnosis are mentioned. It is stated that almost any food may, if the circumstances are favorable, act as an aliergen. The commonest, however, are cereals, egg, milk, fish, and fruits. It is pointed out that, for example, a person sensitive to egg, may, if highly sensitive, exhibit symptoms on ingestion of any food containing even traces of egg; patients with an extreme degree of sensitivity may not be able to eat hens, but may freely eat roosters. Ideal treatment of allergy is the avoidance of the offending food, if this is known. Treatment with various drugs has not been too successful.

Diets of Elderly Women Living Alone. This year-long study was made of 722 women over the age of fifty-five and living alone. Consumption of liquid milk declined slightly with age but was at the uniformly high level of between 5½ and 6 pt. per person per week for all ages. Demand for fats was well maintained into the seventies. Consumption of beef and pork declined with age, but that of mutton, bacon, and ham showed little variation. Consumption of white and fat fish was highest in the sixties but then declined. Old people ate less green vegetables than younger adults. Consumption of citrus fruit appeared to be fortuitously high among those aged fifty-five to sixty-four. Women over fifty-five ate much less bread than the British national average. Between fifty-five and eighty, the pattern of the average diet changes continuously, but the rate of change appears to be greatest on approaching seventy. The energy value of food decreased from 2900 calories per person daily at fifty-five to sixty-four to 2400 calories at eighty and over. The daily average for the group was about 200 calories per person lower than that for elderly couples and about 400 calories lower than that for couples under fifty-five.

PUBLIC HEALTH REPORTS

Vol. 70, April, 1955

*Germ-free amebiasis studies. Research progress report.—p. 410.
*Shellfish importation into the United States. R. S. Green.—p. 415.
*Shellfish poisoning episode in False Pass, Alaska. H. F. Meyers and D. K. Hilliard.—p. 419.

Germ-Free Amebiasis. The difficulties encountered in raising germ-free animals for use in research are described.

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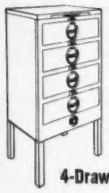

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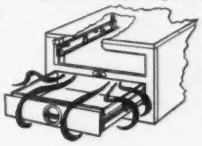

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It is, however, now possible to do so. Amebiasis was studied at the National Institutes of Health. Germ-free guinea pigs and conventional guinea pigs were inoculated with germ-free ameba. Both groups were maintained on identical sterilized rations. None of the thirty-five germ-free animals developed amebic lesions before they were sacrificed on the thirty-third day. Of the thirty-seven conventional animals inoculated as controls, thirty-four developed ulcerative amebic disease, and the remaining three were shown to harbor the infecting agent when sacrificed on the twenty-first day. In contrast, two series of pre-experimental germ-free animals were fed by mouth single species of common intestinal bacteria before being inoculated with bacteria-free ameba. All of these animals developed acute amebic diseases with typical lesions. Thus, evidence is offered that bacteria have a role in the experimental production of amebiasis.

Shell Fish Importation. Complex sanitation problems are involved in the importation of shell fish (fresh or frozen oysters, clams, and mussels). Protection of the consumer is best assured by sanitary controls over conditions attending the growing, harvesting, packing, and shipping of the shellfish. This principle has governed the cooperative domestic shellfish program of the Public Health Service, the states, and industry, and is employed also in an agreement with Canada. Now, however, international trade in frozen shellfish is possible on a worldwide basis. There are difficulties in extending the certification system to other countries. Endorsement of state shellfish sanitation programs presumes that representatives of the Public Health Service keep in close touch with control measures of the individual states by reasonably frequent consultations with state personnel, cooperative investigations, and check inspections. The agreement with Canada specifically includes provisions for the exchange of information on methods of production and handling of shellfish, and for inspection trips across the border. It would not be practical to have such an agreement with many other foreign countries. There are other problems which still have no solution; i.e., the relationship between bacterial content of shucked shellfish in the market and the quality of growing areas and conditions of handling.

Shellfish Poisoning in Alaska. Following the death in Fall Pass, Alaska, of a cannery worker, presumably due to poisoning after eating mussels, a thorough investigation was undertaken. Specimens of *Mytilus edulis* Linnaeus, the shellfish eaten by the cannery workers (only one died, the others were treated in time) were collected from several locations along the beach. The mussels had fed on the dinoflagellate plankton, *Gonyaulax catenella*. Less than 4 oz. raw material would produce lethal results. Conditions existing in the area from which these shellfish were taken more than fulfill the ideal conditions for growth of the dinoflagellate. Further work is planned in connection with shellfish poisoning in the Aleutian chain.

SCIENCE

Vol. 121, April 22, 1955

*Obesity following unilateral hypothalamic lesions in rats. J. Mayer and R. J. Barnett.—p. 599.

Obesity in Hyperphagic Rats. Rats receiving unilateral hypothalamic lesions on the right side were studied. Thirteen of twenty-nine were rendered hyperphagic by the operation and, of these, five exhibited very marked hyperphagia. Their weight gains, however, were generally less than those seen in twenty-eight comparable animals of the same stock subjected to bilateral lesions. Apparently lateral feeding centers must be bilaterally destroyed in order that anorexia prevail, whereas unilateral medial lesions may cause hyperphagia. It seems likely that two centers, bilaterally disposed, both normally act to prevent hyperphagia. The removal of either permits the development of about half the obesity caused by the destruction of both. The excess weight gain following unilateral lesions was about half of that observed after bilateral lesions were made.

AMERICAN RESTAURANT MAGAZINE

Vol. 39, April, 1955

*Preparing and selling food for take home.—p. 74.

*Planning and training food service staffs. C. E. Blackburne.—p. 140.

Vol. 34, May, 1955

*Suggestions on security, sanitation and safety. C. E. Blackburne.—p. 182.

Preparing Take-Home Food. Seventy-five per cent of the restaurants are now preparing food for consumption off the premises. This type of service uses the same skilled personnel which prepare food for the restaurant by merely increasing the amount of the recipes for the day and packaging some of it. Such foods as crisp raw vegetables and casserole dishes with starchy fillers cannot be frozen satisfactorily. Containers for food may be light or heavy duty, made of paperboard, plastic, or metal. Lids for containers may be with or without windows. Wide topped containers make filling and capping easy. Waxed containers should not be used for high temperatures. As manufactured and sold, the round nested containers have bacterial counts low enough to be almost sterile. Heavy duty containers coated with wax or plastic are excellent for freezing foods. Take extreme precautions to be sure utensils and workers are immaculately clean. All food selected should be of highest quality. Fill containers while food is hot, then cool quickly. Refrigerate or freeze as quickly as possible. Do not allow foods to stand unfrozen.

Planning and Training Staffs. Labor hours and costs may be kept to a minimum and high standards maintained only if managers feel a deep sense of responsibility for organizing and training their staffs. Every part of the operation requires advanced planning. Employee selection is important. First analyze the job, then list the qualifications necessary for its performance. For the best selection, try to recruit and interview at least fifteen applicants before hiring. Written applications provide valuable general information. References should be checked. Screen out a small group and then interview for final appraisal. Train the employee carefully. Stress grooming. Give written instructions and formulas, and demonstrate proper techniques. Allow an employee to "learn by doing" while paired off with an older employee. Assign limited duties at first, then increase responsibilities.

Suggestions on Security, Sanitation, and Safety. This article gives ideas on how to supervise and maintain "security" for the management and to promote sanitation and accident prevention among employees. A section of the article on linen control, one of the most important duties in the industrial cafeteria, suggests a control system which will promote considerable saving. Injuries and their prevention in (a) receiving and storing food supplies, (b) preparing foods for cooking, (c) cooking and baking foods, (d) serving foods, and (e) clearing tables and washing dishes, are covered with a detailed checklist to help management to watch for and correct the most common hazards.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 18, May, 1955

*Selecting and training food service personnel. M. McBride.—p. 49.

University Food Service Personnel. College and university food service units differ somewhat from industrial and restaurant enterprises, mainly because they have a seven-day operation and close down completely or in part during vacations. In either urban or rural areas, there is industry with which these units must compete as far as wages are concerned. These and other factors enter into the type of personnel that they are able to employ, train, and maintain. A large percentage of such personnel is student help, and such workers present problems of supervision, training, and attendance. The University of Indiana has devices for control of student employees which include absence and tardiness regulations, bonus systems, progressive wage rate increases, and deduction of school orientation fees for extra work. Students also set up their own merit or promotion system, according to the jobs which they deem easiest. The University, because of a shortage of dietitians, employs non-professional supervisors who have been trained in food service. They must be high school graduates, at least ten years older than students, and able to work easily with young people. Full-time personnel is chosen carefully with the aid of job specifications. Promotion comes from within, and present employees are considered carefully before looking outside

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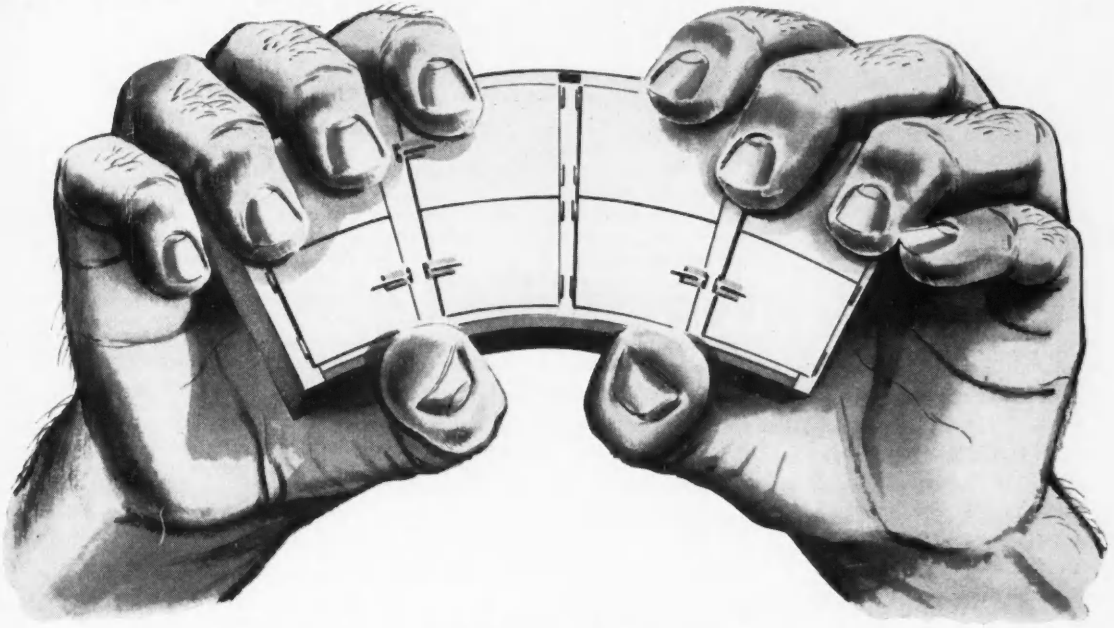

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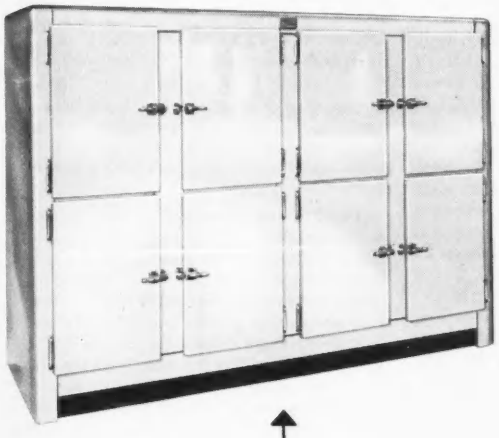

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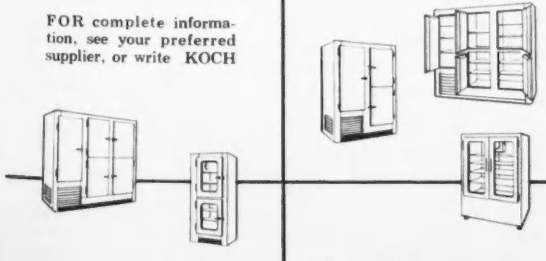

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for replacements. The wise selection and continuous training of food service personnel in colleges and universities should help: (a) reduce operating costs, (b) reduce complaints from employee and student customers, (c) improve service, and (d) produce the best possible food in keeping with the budget.

FOOD ENGINEERING

Vol. 27, May, 1955

*Dehydro-freezing pays off on pimentos.—p. 68.
*Better macaroni products with gum gluten.—p. 73.
*What cathode rays do to eggs and to milk.—p. 78.

Dehydro-Freezing of Pimentos. Dehydro-freezing of pimentos produces a high-quality product, for the pimentos reconstitute rapidly and easily to a deep, rich, red color and retain essentially the same texture as the fresh meat.

Better Macaroni with Gum Gluten. The protein content of macaroni products is increased 12 to 13 per cent with the addition of gum gluten. It imparts mechanical strength to the extruded, dried macaroni; gives better texture, flavor, and palatability to the cooked products; and increases volume and weight on cooking, with a decrease in dissolved solids in the cooking water. The following factors were evaluated in the studies reported: (a) optimum quantity of gum gluten to produce a macaroni product with the desirable cooking qualities; (b) mechanical strength; (c) effects on color; and (d) determination of cooking qualities.

Effect of Cathode Rays on Eggs and Milk. Experiments were conducted using fresh shell eggs and raw skim milk to determine the undesirable changes in flavor and appearance that result from the cathode ray treatment for cold sterilization of foods. Tests on eggs showed that inoculated, fresh shell eggs can be sterilized with a radiation dose of 600,000 rep., but quality is lowered. However, cooking tends to overcome some of the objectionable "stale" flavors. In raw skim milk, the rays produce undesirable flavor changes, increased rennet coagulation time, and a decrease in casein heat stability. Concentrating the milk before irradiation reduces the side reactions and generally yields a more acceptable product. Taste panels indicated that flavor changes were not objectionable when the eggs were fried, scrambled, hard boiled, or baked in a cake. The stale, off-flavor was apparent when soft-cooked in the shell. The off-flavor in the milk was similar to the taste of milk heated at 185°F. for 10 min.

FORECAST FOR HOME ECONOMISTS

Vol. 71, May, 1955

*Feeding babies and children. H. Fleck and E. Munves.—p. 6.

Feeding Babies and Children. Excerpts from the new book, *Everybody's Book of Modern Diet and Nutrition*, give facts on the food habits of children and babies. The baby's happiness is related closely to his food. He is born with the instinct of hunger and the reflexes such as sucking and swallowing, which help relieve his hunger. "Self-regulated" feeding means that the baby should receive nourishment whenever he is hungry and only as much as he wants. A calm, relaxed atmosphere at mealtime is important. Careful planning on the part of the mother is also important, so that there is no last minute rush or disturbance when the child is ready for a meal.

HOSPITAL TOPICS

Vol. 33, May, 1955

*Infant feeding and emotional security. O. W. Anderson.—p. 37.

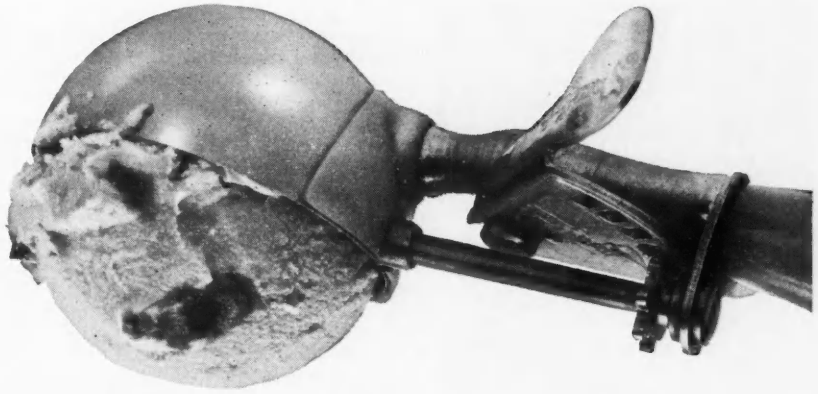
Infant Feeding and Emotional Security. In the last few years, practices in infant feeding have swung from the rigid feeding schedule to the "self-demand" to today's "self-regulation," which implies that a reasonable effort is made to feed the infant according to his needs as an individual. That babies, like adults, vary in their attitudes and their likes and dislikes is seen clearly in the first few months when they demand more food but also begin to regulate their eating patterns. If it is inconvenient for the mother, she may develop an unconscious resentment to rigidity, which is detrimental to both her and the child. The recent concept that the human psyche needs limitations, such as the bounds put around it by society, is applicable to infants when forcing acceptance of a routine. It would seem logical to feed the baby as often as he is hungry for the first month or so, at the end of which time most babies show a rhythm and a mother can establish the routine on this basis. If, after two months, the baby shows no sign of a routine, he should gradually be forced into one. Although in earlier days, it was uncommon to offer babies solid food earlier than six months, today the feeding of solid foods at an early age is accepted procedure.

HOSPITALS

Vol. 29, May, 1955

*We wouldn't be without a food service budget. J. P. Melzer.—p. 109.

Food Service Budget. No one person in an organization can work out a budget that is realistic. Before setting up a budget, each department head should be aware of his unit's expenses and revenue and should be given the necessary information from which to submit a realistic forecast for the ensuing year. In the case of the dietary department's budget, the budget committee, composed of the administrator, the dietitian, and other department heads, arrives at the anticipated volume, or occupancy percentage, for the ensuing year. Patient, personnel, guest, and infant meal census figures for past comparable periods serve as a guide in forecasting volume. Then, the chief dietitian can project amounts and costs of the following items: raw food, salary and wages, supplies and replacements of expendable equipment, and indirect costs or overhead legitimately chargeable to the dietary department. Accurate projection of total raw food costs is impossible unless there are: a definite menu policy; accurate



most likely to appeal

When a patient presents a "feeding problem," ice cream may provide an ideal solution. Containing an excellent form of easily-digested protein, ice cream supplies an abundance of valuable minerals and vitamins, sugar, and moderate fat content for a readily-assimilated source of quick energy.

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An ideal food with which to tempt the older person, ice cream supplies many elements necessary in building resistance to infection[4]—in retaining nutritional status in osteoporosis,[5] in chronic colitis and other gastrointestinal diseases that interfere with digestive processes.[6]

For the pediatric patient, too, ice cream is not only traditional in the post-tonsillectomy period, but is also useful during recovery from poliomyelitis.[7]

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[1]Brewer, W. D., et al: J. Am. Dietet. A. 30:21 [Jan.] 1954. [2]Murphy, G. H., and Wertz, A. W.: J. Am. Dietet. A. 30:34 [Jan.] 1954. [3]Spies, T. D.: J. A. M. A. 153:185 [Sept. 19] 1953. [4]Zeman, F. D., in Stieglitz, E. J.: Geriatric Medicine, ed. 2, Philadelphia, W. B. Saunders Company, 1949, p. 136. [5]Sebrell, W. H., Jr., and Hundley, J. M., in Stieglitz, E. J.: Geriatric Medicine, ed. 3, Philadelphia, J. B. Lippincott Company, 1954, pp. 186-187. [6]Barborka, C. J.: Treatment by Diet, ed. 5, Philadelphia, J. B. Lippincott Company, 1948, pp. 607-608. [7]Seifert, M. H.: J. Am. Dietet. A. 30:671 [July] 1954.

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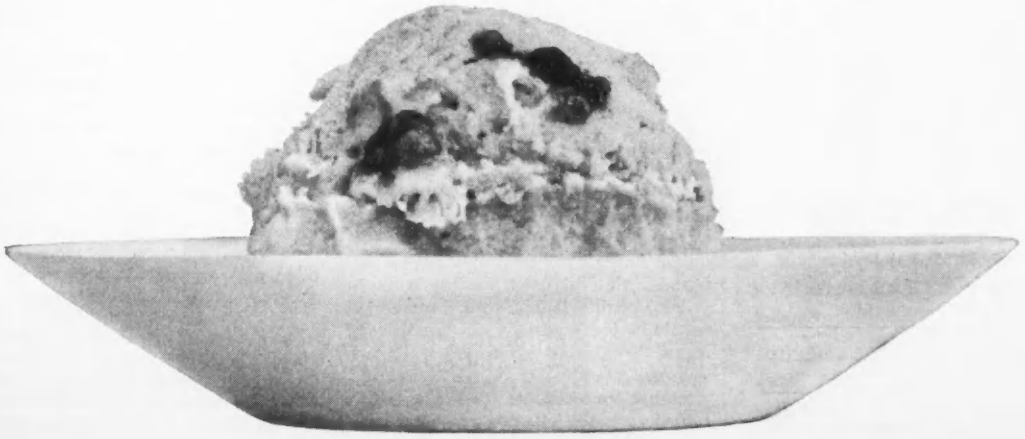

meal census data for patients, personnel, and guests; standard purchase specifications, recipes, and serving portions; an up-to-date, accurate system of inventory; and analysis of present and future marketing trends. Although the budget may appear rigid, it is, in actual use, only a "norm" or "standard." The administrator, dietitian, and controller fully realize that certain expenses are variable and will directly increase or decrease with the number of meals served. Careful comparison between the budgeted and actual cost figures and immediate investigation into causes for variations help the dietitian to control her department effectively.

HOTEL MANAGEMENT

Vol 67, April, 1955

*The human equation. E. Gray.—p. 43.

Human Relations. Although the financial balance sheet is important, so is the human balance sheet. An employee should have devotion for his job and loyalty for his company. These assets can't be bought, they must be earned through management's practice of good ethics. An employee must be proud of the place in which he works; use a little of the profit to keep your place of business up to date. There will be better feeling among workers toward management, thus better products will be produced.

INSTITUTIONS MAGAZINE

Vol. 36, May, 1955

*Sound menu making policy increases volume. G. C. Weaver.—p. 40.

*Seven ways to control food costs. H. Beach.—p. 98.

*Chef constructs office in skylight well of kitchen.—p. 106.

*How to reap worker harvest. V. W. Eimicke.—p. 150.

*Serving buffet style. A. M. Macfarlane.—p. 152.

*Portion control for heat.—p. 168.

Sound Menu Making Policy. Before establishing a menu policy, the type of trade that will be catered to must be determined. Analysis might classify the market as: (a) local business men, (b) local business women, (c) shoppers, (d) transient business men and women (hotel guests), (e) tourists and out-of-town visitors, (f) convention visitors, and (g) local family trade. Some food service establishments will find that their trade is completely different for each meal. Often an operator will not analyze his customer market or will try to cater to all groups, and as a result satisfy no one. The breakfast menu is the easiest to construct, but often is made confusing by offering both an à la carte and a club breakfast and by having too many items. The problem of quick service at lunch calls for simplified menu and careful organization, plus price consideration according to the market. The dinner menu is the most difficult, mainly because the customer market is more varied and discriminating. Dinner menus should be prepared with the idea of having a "specialty" which the customer will remember.

Office for a Chef. A chef of a San Francisco hotel felt that his small desk in the corner of the kitchen was very inefficient, but there was not enough space in the kitchen to move it. Therefore, he built an office in the skylight well which is an 8-ft. cube, with a floor some 9 ft. above the kitchen floor. It is built of plywood and surrounded on three sides by windows which provide a view of practically every part of the kitchen. Access is by a narrow stairway which is steeply pitched to occupy the minimum of floor space. The office is carpeted and air conditioned and includes telephones and an intercommunication system, a small desk, a bookshelf, and clipboards on the wall which are used for filing menus. This office fulfills its function without taking away space from the kitchen.

Selecting Employees. Major steps in selection of employees from among applicants are: (a) job description, (b) worker specification, and (c) selection procedure. In the first step, job description, the employer completely and specifically states what the employee will have to do and be. The specifications should include age, physical characteristics, health status, marital status, education, previous work history, intelligence, numerical facility, verbal facility, manual dexterity, emotional stability, outgoing quality, activity level, and honesty. Once the job description and worker specifications are complete, the procedure of selection can begin. This should include as a minimum the following steps: letter of application and application blank, interview, physical examination, reference check, and testing.

Serving Buffet Style. An inviting buffet table is always intriguing to the guest. In some establishments, this type of service is reserved for special functions; in others, it is not only adaptable to special parties, but is a regular service for luncheon and dinner, Sunday night supper, or afternoon tea. A buffet calls for special planning, which first centers around the menu. Foods must be selected that balance one another, look good and taste good together, can be conveniently prepared and served, and stand up well during the serving period. The manager must work out menu patterns which will include only those dishes that meet his standards and that can be successfully prepared and served at a set price. Next, traffic flow must be analyzed and planned so that the guests can move in an orderly progression while collecting their food. The tablecloth, decorations, and appointments are considered next. The main decorative scheme can be carried out in flowers, fruit, leaves, carved ice pieces, or any combination of these. An effect of elegance can be obtained by the use of an attractive center piece and candelabra. The use of chafing dishes is always a high point of interest on buffet tables. Frosted bowls, or a bowl imbedded in another bowl filled with shaved ice, keep salads and other foods chilled during serving.

Portion Control for Heat. Food service based on electronic cooking makes it possible in many establishments for the same-sized staff to handle 25 to 30 per cent more business with at least a 10 per cent reduction in food

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ONE OF NATION'S TOP TEN BEST PLANNED SCHOOLS

Section of one of twin Thurmaduke Standard Unit Counters installed in the attractive and efficient Beloit High School Cafeteria.

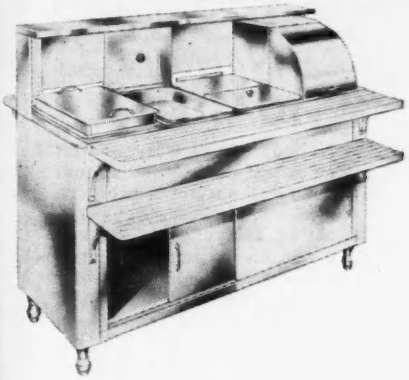
The Thurmaduke Cafeteria Counter is a better *value* because it is assembled from *Standard Units* (hot food units, cold food units, etc.). These are made by modern production line methods in a new factory designed for the purpose, eliminating costly and inaccurate hand forming.

Delivery is faster . . . installation easier. The all-welded steel Standard Units bolt securely together to form one rigid structure. There is a minimum of plumbing connections.

Proved design principles, developed through years of experience in thousands of installations, result in exceptional efficiency and durability . . . easy sanitary maintenance.

All hot or cold units are fully insulated and thermostatically controlled to maintain the temperature required to keep food kitchen-fresh for hours. There are no unsanitary, inefficient water-pans, so operating costs are surprisingly low.

A complete selection of units is available in various sizes including corner units, to match your requirements, regardless of length or arrangement of counter.



Thurmaduke Waterless Food Warmers are available in many sizes, including portable models. *Selective Heat Control* in each fully insulated section preserves flavor, reduces shrinkage, cuts operating costs as much as 80%.

THURMADUKE

DEPENDABLE FOOD SERVICE EQUIPMENT

DUKE MANUFACTURING CO. Dept. D-7
2305 NO. BROADWAY, ST. LOUIS 6, MO.

Please send complete information on
☐ Cafeteria Counters ☐ Food Warmers

NAME_____

ADDRESS_____

CITY AND ZONE_____ STATE_____

costs. Speeded production and prompt service of hot foods on a wide variety of menu items are two of the advantages. One of the most important is that electronic cooking cuts over-production, because the food can be cooked quickly as ordered. Some items, such as Italian-style specialties, can be precooked and then reheated during rush hours. In electronic cookers, small amounts of vegetables can be cooked, thus disposing of the waste caused by "waiting too long" to serve them.

MODERN HOSPITAL

Vol. 84, May, 1955

*The cafeteria comes to the patients. 1. Mobilteria makes the best of two systems. M. Stanton.—p. 114.

*The cafeteria comes to the patients. 2. Costs go down as service speeds up. W. P. Earngey, Jr.—p. 120.

Mobilteria. The "Mobilteria" is a hot and cold food cart used in McLeod Infirmary, Florence, South Carolina, in which have been incorporated the advantages of both a "centralized" and "decentralized" serving system, with disadvantages of neither. The original requisites for the mobilteria were: (a) it must carry food enough for 100 patients in a heated container and also be capable of being refrigerated when needed for desserts and salads; (b) it must carry trays, dishes, and so on for 100 patients; (c) it must provide separate space for the 14 to 18 per cent of meals which are modified diets; (d) it must have space for several liquids; (e) each hot food compartment must be individually controlled by thermostat; (f) it must be portable; (g) it should be of stainless metal for ease in cleaning. The system, in addition to delivering food promptly while it is at the proper temperature, cuts down on labor cost, saving the Infirmary $9464 per year. Serving time has been reduced by half. The article contains figures on labor saving, serving capacity, weight and dimensions, and storage temperatures for hot foods in the "mobilteria."

Costs Reduced, Service Increased. Harris Hospital, Fort Worth, Texas, developed a mobile cafeteria unit that speeded up service which at the same time was flexible enough to meet the strict dietary requirements of the medical staff. Experimentation with centralized and decentralized food systems proved both to be unsatisfactory, both from the standpoint of service and of labor. The equipment developed at the hospital was specifically designed to handle enough hot and cold food, plus all dishes, condiments, silver, and so on to serve approximately seventy patients, and service is mobile enough that the serving position can easily be changed four times during the distribution operation on any one floor. Food preparation is centralized, and food arrives on the floor in bulk. Two people at opposite ends of the mobile unit assemble the trays. A pass-through window in the conveyor allows trays to be passed to nurses, for delivery to patients. When all patients in one section have been served, the unit can be easily moved to another section. Patients received both hot and cold foods at the right temperature, and those who order from the selective menu can even make last-minute changes. Noises and odors from the floor kitchen are eliminated. From an economic standpoint, less time is required of the nurses for serving meals, and the payroll, on the basis of direct labor service to patients, has been reduced 30 per cent.

PERSONNEL JOURNAL

Vol. 34, May, 1955

*Performance appraisal interviews communicate both ways. H. H. Meyer.—p. 6.

*How to get going with a reading improvement program. C. H. Lawshe and R. E. Chandler.—p. 15.

Employee-Supervisor Performance Interviews. The periodic performance review in which a man and his supervisor talk things over in a friendly way is a valuable personnel device. However, preparation for such an interview by both men is essential to the best results, for to enter such a discussion "cold" may result in more harm than good. The objectives of both the employee and the supervisor are somewhat the same: both want to develop a better working relationship and improve performance, to know clearly what is expected, and to develop greater performance around these expectations. In preparation for the interview the supervisor should study carefully the employee's personnel and performance records, previous appraisal

FAST toast production

FASTER seat turnover

MORE profits

YOU'LL GET ALL 3 WITH Savory TOASTERS!

Nobody has to tell you that quick seat turnover during rush hours is the secret to profitable meal service. That's why eliminating delays, confusion and lost motion in preparation areas means – *more profits for you.*

One of the worst offenders in meal delays is an inadequate, slow toast service. So why put up with it – when a SAVORY toaster produces more and better toast in less time and at lower cost per slice than any other commercial toaster!

Only toaster operating on the continuous conveyor system, a Savory toaster – either gas or electric – completely eliminates bottlenecks at the toaster station. There's always room for loading, and finished toast is delivered automatically to the serving tray.

And what toast! Savory toast is the finest you can serve. For toasting bread or buns, investigate Savory toasters before you buy. Gas operation costs less than ¾¢ an hour – electric requires low connected loads. Ask your Supply Dealer for full information, or write today.

Savory EQUIPMENT, INCORPORATED
126 PACIFIC ST., NEWARK, N. J.

Enriched Bread...

Low Cost Insurance Against Nutritional Ills

In recent years the improved pattern of foods consumed in the United States has largely eliminated frank forms of nutritional deficiency diseases. This great gain in public health is attributable in large measure to the nationwide distribution of nutritionally improved staple foods, well exemplified by enriched bread.[1] "Such improvement of foods in the United States has been described as low-cost insurance against nutritional ills."[2,3]

Present-day enriched white bread, enhanced in B vitamins, minerals, and milk protein content, serves as an important nutritional protection to consumers. In particular, low-income groups, who eat large amounts of enriched bread because of its low cost, benefit by its high nutritional values.[3]

Wherever sold, enriched bread complies with the federal definition and standard for the product. Per pound, enriched bread provides at least 1.1 mg. of thiamine, 0.7 mg. of riboflavin, 10 mg. of niacin, and 8 mg. of iron. By and large, it also supplies about 400 mg. of calcium and 39 grams of protein. Since the protein consists of flour and milk proteins, it is biologically effective for growth as well as tissue maintenance. Enriched bread is one of the reasons why "We are a nation . . . fed on a plane of nutrition unequalled anywhere in the world."[4]

1. King, C. G.: Newer Concepts of Optimum Nutrition, Food Technol. *8*:486 (Nov.) 1954.
2. U.S. National Office of Vital Statistics: Vital Statistics of the United States, 1948. Part I. Washington, D.C., U.S. Government Printing Office, 1950.
3. Sebrell, W. H.: Developing Modern Nutrition Programs, Public Health Reports, United States Department of Health, Education, and Welfare *69*:277 (Mar.) 1954.
4. Josephson, D. V.: Review of Chemical Mechanisms Affecting Flavor Acceptability of Dairy Products, J. Agr. & Food Chem. *2*:1182 (Nov.) 1954.

The nutritional statements made in this advertisement have been reviewed and found consistent with the best current scientific opinion by the Council on Foods and Nutrition of the American Medical Association.

AMERICAN BAKERS ASSOCIATION

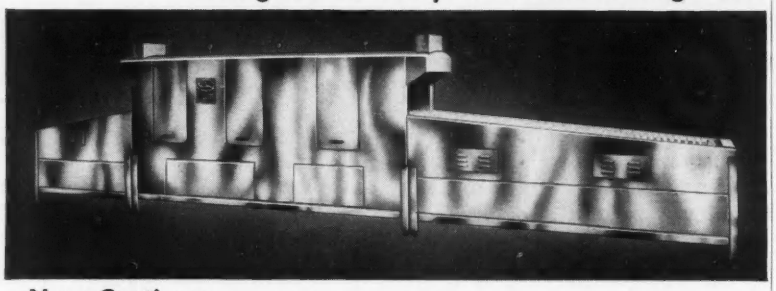
20 NORTH WACKER DRIVE • CHICAGO 6, ILLINOIS

results, position guide, and relationships with other workers. The employee should review his position guide, evaluate his own performance, appraise his working environment, and think of his aspirations. Pre-appraisal questionnaires have worked successfully in some companies, and both employees and supervisors have found these forms help in leading into a frank discussion and developing a friendly and constructive atmosphere for the interview. The supervisor should always be objective and constructive and concentrate on the employee's performance rather than his personal characteristics.

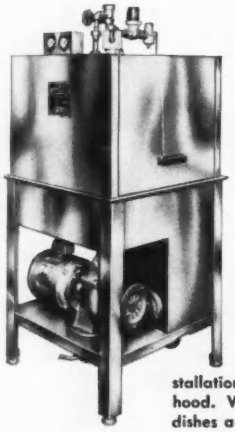
Reading Improvement Program. Poor reading habits take time away from the executive's duties. Many executives with this problem have turned to reading training for help. Through proper training, practically every adult can improve his reading skill, and, with few exceptions, can double his present reading rate. Personnel enrolled in a good program will not only increase speed, but will find their improvement long lasting. The better programs strive to achieve these common objectives: (a) make the individual more critical and observant, (b) strengthen his vocabulary and increase his potential for clear understanding and communication, (c) create diversified reading interest by broadening his vicarious experience, and (d) increase permanently his rate of reading with a satisfactory level of comprehension. Fast readers comprehend more than slow readers. Self-instruction is one way to improve, but it is slow and often not lasting. There are two types of programs for improvement; one uses mechanical aids and the other doesn't. The first type is more popular and yields best results. In-plant programs seem to be most successful. The article includes a list of equipment and prices used for this type program.

TWO NEW COLT AUTOSANS

designed to cut your dishwashing costs



New Continuous Auto-Racking Model AR



NEW in design, NEW in construction! This big new Autosan washes and sanitizes up to 15,000 pieces an hour . . . economically!

It flushes and water scraps, either at water-main pressure or powered to 180-gallons-per-minute (optional at no extra cost). It washes with amazing thoroughness, power rinses, then *sanitizes* with Colt's exclusive final fresh-water rinse!

Extra-wide 22½-inch **AUTO-RACKING** conveyor speeds loading. Nylon-covered stainless steel cross-bars prevent breakage. Three-speed conveyor instantly controlled by push-pull selector switch.

Entire unit is welded into one joint-free, completely leak-proof compartment. Hinged door on each tank for easy cleaning of non-corrosive interior.

Exclusive baffle system extends entire length of machine — prevents food accumulation on conveyor. Stationary spray arms for greatest efficiency. Permanently aligned direct-drive pumps with stainless steel sleeves.

TWO separate safety devices stop conveyor when jammed at take-off point, when machine is overloaded, or when jamming occurs at *any* point in machine.

Standard equipment: all panels, UL & ASME-approved steam booster, chimneys at each end with damper-controlled vents.

New Compact Rack Type Model R1-20

Extremely compact for straightaway or corner installation — only 56 inches to top of hood. Washes and sanitizes 1,250 dishes an hour!

Famous Cloudburst Action scours away every particle of soil!

Sanitizes as it rinses! Powerful spray of scalding hot water from 10 specially designed nozzles.

Convenient and safe to operate and clean! All working parts either hinged or removable without use of tools. Wash chamber doors counterbalanced. Machine automatically shuts off when doors are opened.

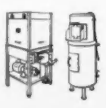
Competitively priced! Economical to buy — economical to operate.

Write for details about these new, rugged Colt-built Autosans and other models designed to lighten kitchen loads at lowest cost.

COLT'S MANUFACTURING COMPANY, Dept. D-7, HARTFORD 15, CONN.

DISHWASHING, SANITIZING, DRYING MACHINES, AND VEGETABLE PEELERS

COLT AUTOSAN



Made by the makers of famous Colt Handguns, Industrial Packaging Equipment, and Molded Plastic Products

RESTAURANT MANAGEMENT

Vol. 76, May, 1955.

* Making better use of gas cooking equipment. A. W. Dana.—p. 59.

Gas-Fired Cooking Equipment. This article tells how to improve quantity food preparation and cook faster with gas, either manufactured, natural, or liquid-petroleum. Efficient ways to broil meats in quantity, such as steaks, chops, and chickens, are included, as well as methods to simulate a charcoal-cooking effect with a gas broiler. Oven-broiling hamburgers, pork chops, fish, bacon, and so on may be improved by the use of wire racks in the baking pan. The use of wire racks in roasting pans is recommended because it avoids contact between the roast and the hot fat in the bottom of the pan. When roasted with the fat side up, the meat will be self-basted, and there is very little shrinkage. In making better use of deep-fat fryers, the usable life of fat can be doubled by vigilant draining, straining and filtering, and by cleaning the interior of the equipment after each meal. Alternate cooking with twin baskets will reduce the cooling effect on the fat of new loads of food. Self-generating compartment steamers, cabinet-type pressure cookers, and steam-jacketed kettles that are supplied with steam by self-contained gas-fired units are excellent devices for speeding the preparation of meat, poultry, vegetables, and other foods. Where steam is used in cooking and is the major source for heating water, the steam booster should be properly sized, and in many cases a gas-fired hot water booster or a supplementary hot water storage tank should be used in conjunction with dishwashing. The article also includes hints on heating coffee brewing equipment, using conveyor-type toasters, how to get the most heat out of hot food storage units, and cooking with counter appliances.

WHAT'S NEW IN HOME ECONOMICS

Vol. 19, May, 1955

*Baby's food.—p. 20.

*The tried and the new in meat cookery. I. S. Willson.—p. 22.

*Microwave cooking. D. A. Copson.—p. 26.

Baby's Food. Eating, for the baby, is not only necessary for health and growth but is also an educational experience. Food habits developed at a young age are likely to last a lifetime, and for that reason the feeding atmosphere should be pleasant and relaxed. Emotional hunger, also, is important. Studies have shown that babies who were held, especially bottle-fed babies, have

Your Three Roles as an Army Dietitian—

• YOU PLAY *three* roles as an Army Dietitian—and star in each!

• In your first role you serve *humanity*. You work in modern, well-equipped Army hospitals with a top group of dedicated professional men and women. Your performance is further enhanced by fine specialized experience in the latest techniques and developments of your field.

• In your second role you serve your *country*. You wear the uniform of an Army officer and enjoy all the privileges and prestige of military status. Your insignia mark you as one who uses her professional skills for the *direct* benefit of the nation.

• In your third role you serve *yourself*...with the many opportunities for personal development that come to an officer in the Women's Medical Specialist Corps. You have a chance to travel, meet interesting people, and extend your horizons. And you have the leisure to enjoy these things—with a yearly 30 day paid vacation.

• Make your career personally and professionally complete. Star as an Army Dietitian—serving humanity, country and self. For full details, fill out the coupon below.

Women's Medical Specialist Corps

U.S. ARMY MEDICAL SERVICE

FILL OUT THIS COUPON TODAY

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The Surgeon General, United States Army
Washington 25, D. C.
Attn: Personnel Division

Please send me further information on my opportunities as a Dietitian in the United States Army.

☐ *Check if also interested in training opportunities.*

My present status is (check one)

STUDENT:
——High School
——College
——Professional Nurse

GRADUATE:
——College
——Professional Nurse

OTHER: ——

Name ——

Address ——

City —— *State* ——

IBM chooses AUTOMATIC again!

In conjunction with its new World Headquarters cafeteria in New York City, International Business Machines recently purchased an Automatic Food Shaper. This machine is installed in the spotlessly clean kitchen where it is used to prepare hamburgers and other food patties served in the bright, cheery employees' cafeteria. A previously purchased Automatic Food Shaper is in operation at IBM's Endicott, New York plant cafeteria.

By serving delicious, wholesome meals at low cost, this highly progressive company is doing much to promote better employee health and efficiency. By completely eliminating expensive, unsanitary hand shaping, the Automatic Food Shaper helps IBM keep preparation costs at a minimum while serving its employees a nutritious, wholesome meal.

Write for literature that describes our three electrically driven models available with capacities of hundreds or even thousands of patties an hour—all with one operator!

AUTOMATIC FOOD SHAPING CO., INC.
58 New Street **New York, New York**

FREE

Send Today for the CELLU Catalogs

For many low-sodium, flavorsome salads and hot dishes.

Flavorsome Variety
FOR SODIUM RESTRICTED DIETS

CELLU RICE COOKIES—Crisp, delicately flavored cookies. Prepared with rice and potato flours, sugar, shortening, eggs, orange juice, cocoanut and sodium-free baking powder. Each cookie contains average of only 1 mg. sodium. Available in 5-oz. Pkges.

CELLU LOW SODIUM CAKE—Delicious, pound-type cake sealed in 11-oz. tins. Just slice and serve. Natural sodium content is 10 mgs. in 100 grams.

Tangy, sodium-free seasoning.

SODIUM RESTRICTED
CELLU Dietary Foods
CHICAGO DIETETIC SUPPLY HOUSE Inc.
1750 West Van Buren Street Chicago 12, Illinois

a sense of security and contentment, finish their feeding in a more relaxed condition, and sleep more contentedly than those who are left to eat alone. Breast feeding is the most satisfactory for a young infant because mother's milk supplies nutrients in the right proportions. The baby's diet grows in scope as he grows, and there is no set age at which semi-solid foods should be added. Learning how to recognize and adjust to new foods, drinking from a cup, and eating with utensils are big adjustments for a baby. Texture and taste play an important part in the baby's acceptance of foods. When chewing is mastered, the texture of foods can be changed from strained to mashed or chopped.

Meat Cookery. Research in meat cookery began in 1907 when Sprague and Grindley at the University of Illinois first used a thermometer to determine the doneness of roast beef. Since then, research has proved that control of cooking temperature and cooking time is essential to successful results. A moderately low temperature in cooking meat not only produces more servings, but more palatable meat than a high temperature. Most modern ovens, ranges, roasters, and broilers have temperature controls, but a thermometer is the only accurate way to tell when meat has reached the desired degree of doneness. The oven regulator maintains the correct roasting temperature, while the meat thermometer acts as a stop watch, telling when to stop the cooking. Time tables given in "minutes per pound" should also state temperatures; otherwise they have little meaning. Many factors affect cooking time, such as shape of cut, size, quality, and degree of doneness desired. The increase in the popularity and use of frozen meats brings a new problem in meat cookery. Actually, the meat can be cooked, with a slightly longer time, the same way it would have been cooked fresh.

Microwave Cooking. In microwave cooking, heat is generated in the food itself by an interaction in which the waves lose energy to the food, causing it to heat. The utensil and the oven remain essentially cold. The microwaves absorbed by the food can be transmitted by glass, plastic, and paper, and reflected by metal, and are very different from conventional cooking which relies on conduction of heat through air, water, or oil to the surface of the food and thence to the interior. Timing in microwave cooking is extremely short; bacon cooks in 1 min. and there is no soiled skillet, no turning. An 8-in. layer cake requires 4 to 5 min. Food cooked for a short time by microwaves does not brown, but it can be browned separately before cooking. The flavor is maintained and often improved in this kind of cooking. The microwave range is similar to conventional ranges in that it gives off no fumes, but is different in that it does not depend on contact with the utensil for cooking. Cost of these ranges may be 25 to 55 per cent more than conventional equipment. However, if they become standard equipment in the kitchen, food preparation time for the homemaker will be cut from hours to minutes.

A New Product of Original Roche Research

Beta CAROTENE 'Roche'

Gives processed foods true, natural yellow color and vitamin A potency

Nutrition experts will be interested in the latest product of the Roche research laboratories—beta carotene 'Roche.' This exclusive development offers food processors a means to make their good foods better because it contributes true natural yellow color *and* vitamin A potency.

In creating its famous synthesis of vitamin A, Roche found that the synthesis of beta carotene was closely related. As so often happens in research, findings made in the course of the project opened up new avenues for investigation. This was the case with 'Roche' vitamin A and 'Roche' beta carotene, both of which are now commercial realities.

Advantages of Beta Carotene 'Roche'

Vitamin A activity. Theoretically, one gram of pure beta carotene is equivalent to 1.67 million U.S.P. units of vitamin A.

Natural coloring. Beta carotene is the natural coloring of many foods, such as dairy products, cereal grains, alfalfa, carrots, and other vegetation. Beta carotene 'Roche' imparts a *true* natural yellow color without any tinge of green. It does not change to a reddish color as do some vegetable pigments during storage.

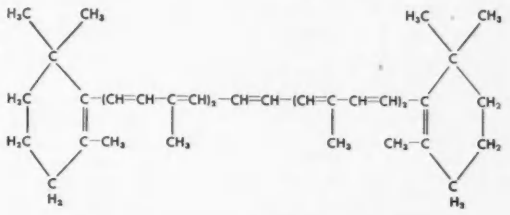
Color stability. Extensive laboratory data show excellent color stability.

Uniformity. The high degree of purity and color stability ensures uniform and constant vitamin A activity and color when using equal amounts per manufacturing lot.

Uses. Beta carotene 'Roche' is ideal for use in the following because it gives them *natural* yellow color and vitamin A potency.

Margarine — Shortening
Butter — Cheese
Edible Oils — Confections
Yellow Bakery Products
Food supplement products of pharmaceutical manufacturers

TECHNICAL INFORMATION
Empirical Formula: $C_{40}H_{56}$



Crystalline beta carotene 'Roche' is in the all trans form.

Note that one molecule of beta carotene can be converted into two molecules of vitamin A.

Molecular Weight: 536.85

Melting Point: 183.0

Appearance: Red-violet platelets

Solubility in Edible Oils:

At room temperature ..... about 0.08%
At 60 C. ..... about 0.2 %
At 100 C. ..... about 0.8 %

Biological Properties:

0.6 microgram beta carotene: 1.0 units of vitamin A

1.0 gram beta carotene: 1,666,666 + U.S.P. units of vitamin A

PACKAGING

Beta carotene 'Roche' is packed as a 24% semi-solid suspension (400,000 units per gram beta carotene 'Roche') in vegetable oils; tamperpruf metal containers. Combination blends of beta carotene 'Roche' and vitamin A 'Roche' are also available for food processors' specifications.

ROCHE—*World Leader in Vitamins*

VITAMIN DIVISION • **HOFFMANN-LA ROCHE INC.** • NUTLEY 10, NEW JERSEY
NUtley 2-5000

Pacific Coast distributor: L. H. BUTCHER COMPANY
San Francisco • Los Angeles • Seattle • Portland • Salt Lake City
In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec

Briefs on the 38th Annual Meeting

St. Louis—October 18 through 21, 1955

HISS THE VILLAIN—CHEER THE HERO

Since Thursday, October 20, is an "open" night, you may want to go aboard Captain Menke's historic Golden Rod Showboat which is anchored at the foot of Locust Street on the Mississippi. Oldtime melodramas are presented nightly throughout the year.

BLEND OF OLD AND NEW

If you enjoy absorbing the flavor and personality of a city, take a sight-seeing tour of St. Louis. A 2-hr. trip is available in the mornings and a grand tour of 3½ hr., in the afternoons.

An irrepressible and animated encyclopaedia will innundate you with more statistics and historical lore than you will be able to digest. He will tell you that St. Louis is a little larger in area than Chicago; that its population, including the suburbs, is 1,700,000, the eighth largest city in the country; and that it ranks third in industry.

He will cruise down along the Mississippi, showing you the river front where a stone marks the landing place of the city's founders. You will see one of the most ancient structures of St. Louis, the Old Rock House, which, in 1818, was a trading post. Later, Wilson P. Hunt, leader of the Astor expedition to Oregon, made wagon covers for immigrant trains in the building. John Clemens had a sail rigging and tarpaulin loft on the second floor in 1851.

He will drive you past the Old Cathedral, one of the oldest churches in the Midwest and the fourth to be constructed on the site. It is told that Jesuit priests from the north country paddled down the Mississippi in a canoe bearing the Host with its lighted candle. The same light was still burning when the Host was placed in the log church which they constructed. The first mass was held in 1764.

A museum, located at the rear of the Old Cathedral, is open to the public, at certain hours each day.

The conductor will point out an open-air market, willed to the City by a French forefather, with the provision that it always remain an open market—a condition which is proving awkward today because it lies in the area which is being developed into an extensive park.

The tour will take you past aging structures with wrought-iron balconies, reminiscent of the days when St. Louis was within French territory. It will pass within sight of the home of Eugene Field, who wrote "Wynken, Blynken and Nod."

You will learn that St. Louis possesses the largest brewery and the greatest fur market in the world. It is the second largest trucking center of the U.S.; the fourth largest drug producer; is a leading grain market and manufacturer of stoves and ranges, woodenware, brick, shoes, and clothing.

Your articulate "loud speaker" will point out the eight bridges which span the Mississippi, paying particular attention to Eads Bridge, the first steel-truss bridge ever built. It was designed by James B. Eads and completed in 1874. Engineers of that day thought its long spans impractical and dangerous, questioning the use of steel for such a bridge.

Among the other sights of interest, he will point to the "Old Court House," a century in age, from the east door of which slaves and other personal property were auctioned in antebellum days.

PRESENTED ESPECIALLY FOR YOU

You'll enjoy . . . you'll learn . . . you'll benefit from your visits with the many exhibitors who will bring their products to the Kiel Auditorium for you to see. Representatives of commercial companies, who exhibit at many conventions during the year, state that the A.D.A. Annual Meeting offers the very finest show.

Intermissions will be scheduled Tuesday through Thursday to give you an opportunity to collect information which will prove of value to you throughout the year.

The *Evaporated Milk Association* will display a new booklet of *Tested Recipes for 50 and 100 Servings*. This free booklet is comprised of practical recipes developed by Fern Gleiser and Alice Teasdale of the University of Chicago.

Pause at the Sexton Hospitality Center for a refreshing cup of Sherman Blend Exquisite Coffee or a cheery cup of Sherman Blend Luxury Tea. *John Sexton & Co.'s* food booth will feature attractive menu suggestions, paper goods, and chemical detergents and disinfectants.

New Arrowhead decorated dinnerware of various patterns will be introduced by *International Plastics, Inc.* Another innovation is a Crystalon ribbed, 4-oz. tumbler with a flair top, for the serving of juices and small drinks.

Institutions Magazine will call your attention to *Institutions Catalog Directory* and to its monthly magazine.

Information on bread handling practices in hospitals, based on the *American Institute of Baking's* 1954–55 nationwide survey, will be given you by Consumer Service representatives. Learn from them about the Institute's free nutrition educational items, quantity recipes, and field nutrition services.

There will be delicious apple juice on tap at the *Processed Apples Institute* booth. You are invited to come, be refreshed, and sign up for quantity recipe cards and new educational material.

Two new products—Kraft soup bases and Kraft PC catsup (in individual containers)—will be featured in the complete institutional line on display at the *Kraft Foods Co.* booth. Requests for Kraft Cuisine Service, tested quantity recipes for school lunch service, and other recipe and educational material may be made at the booth.

You will want to see the *Market Forge Co.'s* newly developed product, the Mark Fore compartment-type, steam cooker which has a stainless steel pedestal base, for sanitary installation, and which is equipped with automatic controls. All of the piping is enclosed.

Your SIMILAC representatives, of *M & R Laboratories*, will be pleased to discuss with you the role of Similac in infant feeding. They will have for you the latest Pediatric Conference Reports and reprints of pediatric nutritional interest.

The *Cream of Wheat Corporation* invites you to discuss the dietary applications of Enriched Quick and Regular Cream of Wheat with its representative. Vitamin Food Charts, special diet folders, baby feeding leaflets, and recipe folders will be available for your inspection and use.

A new formula for Whip Topping will be introduced by *Rich Products Corporation*. It is flavored and sweetened and ready for immediate use. It need not be kept frozen. It can be stored under ordinary refrigeration for days and simply poured into the mixing bowl, all ready to be whipped.

Macmillan Company will display recent and standard books of interest to Association members. Featured will be the new 11th edition of the popular Proudfit-Robinson *Nutrition and Diet Therapy*.

The exhibit of the *National Live Stock and Meat Board* will be based on the recommended daily food intake for adequate teen-age nutrition, showing adolescents' needs for protein and other nutrients to be one-third to one-half more than that of their parents.

Tubular stainless steel dish trucks, which are a very recent addition to the *Jarvis & Jarvis, Inc.* line, will be displayed along with stainless steel clean dish storage trucks. One type is completely enclosed for ideal sanitation.

Quality Bakers of America will present Sunbeam bread, rolls, cakes, and pies. Sunbeam is the largest selling brand bread in the world and is baked in forty states and Canada.

Watch this page each month for Annual Meeting news.

Application for Housing Accommodations

THE AMERICAN DIETETIC ASSOCIATION

St. Louis, Mo. • October 18–21, 1955

For your convenience in making hotel reservations for the coming meeting of THE AMERICAN DIETETIC ASSOCIATION on October 18–21, 1955 in St. Louis, hotels and their rates are listed below. Use the form at the bottom of this page, indicating your first, second and third choice. Because of the limited number of single rooms available, you will stand a much better chance of securing accommodations of your choice if your request calls for rooms to be occupied by two or more persons. All reservations must be cleared through the Housing Bureau. ALL REQUESTS FOR RESERVATIONS MUST GIVE DEFINITE DATE AND HOUR OF ARRIVAL AS WELL AS DEFINITE DATE AND APPROXIMATE HOUR OF DEPARTURE, ALSO NAMES AND ADDRESSES OF ALL PERSONS WHO WILL OCCUPY RESERVATIONS REQUESTED *MUST* BE INCLUDED.

Hotel	For one person	For two persons		2-Room Suites
		Double Bed	Twin Beds	Parlor & Bedroom
JEFFERSON*	6.00– 9.00	9.00–12.00	11.00–15.50	25.00–39.50
LENNOX	5.00–10.00	6.50–10.50	10.00–12.50	18.00 & Up
MARK TWAIN	4.00– 7.50	5.50– 9.00	8.00– 9.00	12.50 & Up
MAYFAIR	5.00–10.00	6.50–12.00	8.50–12.00	14.50 & Up
STATLER	5.00–11.00	7.50–14.00	9.00–18.00	30.50–32.00

In the event that the hotel room rate structure is changed prior to the above convention these rates will be changed accordingly. (See map on page 530—May issue)

* Headquarters

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO: September 18, 1955

Hotels Convention Reservation Bureau, A.D.A.
Room 406—911 Locust St.
St. Louis 1, Mo.

Please reserve the following accommodations for: THE AMERICAN DIETETIC ASSOCIATION Convention in St. Louis, Missouri on October 18–21, 1955

Single Room.....Double Bedded Room.....Twin Bedded Room.....
2 Room Suite.....Other Type of Room.....
Rate: From $.....to $.....

First Choice Hotel.....
Second Choice Hotel.....
Third Choice Hotel.....

Arriving at Hotel (date).....hour.....A. M.....P. M. Leaving (date).....hour.....A. M.....P. M.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names of *both* persons for *each* double room or twin bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

.....
.....
.....
.....

(Individual Requesting Reservations)
Name.....
Address.....
City and State.....

If the hotels of your choice are unable to accept your reservation the Hotels Convention Reservation Bureau will make as good a reservation as possible elsewhere provided all hotel rooms available have not already been taken.

News Notes

A.D.A. Officers for 1955–56. The following will be the elected officers of The American Dietetic Association for the coming year:

PRESIDENT—Winifred H. Erickson, Ancker Hospital, St. Paul

PRESIDENT-ELECT—Lucille M. Refshauge, Hartford Hospital, Hartford, Connecticut

SPEAKER OF THE HOUSE OF DELEGATES—Marguerite L. Pettee, University of Colorado Medical School, Denver

SPEAKER-ELECT OF THE HOUSE OF DELEGATES—Adelia M. Beeuwkes, School of Public Health, University of Michigan, Ann Arbor

TREASURER—Doris Johnson, Ph.D., Grace-New Haven Community Hospital, New Haven, Connecticut

SECRETARY—Mary Ellen Johnson, Colorado State Hospital, Pueblo

DELEGATES-AT-LARGE

Mildred Bonnell, University of Washington, Seattle—1956

Margaret A. Ohlson, Ph.D., Michigan State College, East Lansing—1956

Ercel S. Eppright, Ph.D., Iowa State College, Ames—1957

Helen A. Hunscher, Ph.D., Western Reserve University, Cleveland—1957

Beulah Hunzicker, Presbyterian Hospital, Chicago—1958

C. Frances MacKinnon, University of North Carolina, Chapel Hill—1958

NOMINATING COMMITTEE

Geographic Area I—A. June Bricker, Metropolitan Life Insurance Company, New York City

Geographic Area II—Ruth W. Spencer, Central Office, Veterans Administration, Washington, D. C.

Geographic Area III—Margaret L. King, Henry Ford Hospital, Detroit

Geographic Area IV—Marjorie M. McKinley, Iowa State College, Ames

Geographic Area V—Helen Rankin Demsey, Mills College, Oakland, California

Mrs. Martin Honored. Ethel Austin Martin, formerly Director, Department of Nutrition Services, National Dairy Council, received the Honorary Degree of Doctor of Science from South Dakota State College at commencement exercises held on May 23. Mrs. Martin was selected to receive this honorary degree as one of the College's "most distinguished graduates." Her most recent work has been the task of revising *Robert's Nutrition Work with Children*, which was published last fall.

WHO News. On May 10, the Eighth World Assembly of the World Health Organization convened at the new University City in Mexico City. The Assembly, meeting for the first time on the American continent, had delegations from most of the eighty-four member states and associate members of WHO. In addition to formal sessions, the Assembly featured informal technical discussions on the subject of public health in rural areas, and delegates enjoyed visits to various health centers in Mexico. Dr. Ignacio Morones Prieto, Mexican Minister of Health since 1952, served as President of the Assembly.

Presentation of the Leon Barnard Foundation Prize and Medal was an outstanding event of the meeting. This honor was bestowed on Dr. Andrija Stampar, President of the Yugoslav Academy of Sciences and Arts, in "recognition of his outstanding contribution and practical achievements in the field of social medicine."

Following the meeting in Mexico, a post-assembly conference for delegates was held in Washington, Baltimore, and New York City, under the sponsorship of the U. S. National Citizens Committee for the World Health Organization. Delegates enjoyed conducted tours through the Clinical Center for Research of the U. S. Public Health Service, Bethesda, Maryland, and the Johns Hopkins School of Hygiene and Public Health and Johns Hopkins Hospital, Baltimore. When they reached New York City, thirteen different meetings on such high priority problems as infectious hepatitis, insect-borne viruses, poliomyelitis, cancer, and influenza, were presented.

Pork Grades. Revised standards for grades of pork have been announced by the U. S. Department of Agriculture. One of the two major changes discontinues the use of the word "Choice" in names of federal grades for slaughter barrows and gilts and pork carcasses. The new names for grades will be: "U. S. No. 1," "U. S. No. 2," and "U. S. No. 3," for the grades which were previously designated "Choice No. 1," "Choice No. 2," and "Choice No. 3." The names of the other two grades, "Medium" and "Cull," remain unchanged. In addition to the name changes, the minimum back fat thickness required for each grade has been reduced. The five revised grades may be summarized as follows:

U. S. No. 1: Slaughter hogs with near minimum finish required to produce high quality pork cuts. Carcasses have a relatively high ratio of lean to fat and usually yield more than 50 per cent of their weight in the major lean cuts of hams, loins, picnics, and Boston butts.

U. S. No. 2: Slaughter hogs slightly fatter than necessary to produce high quality pork and yielding cuts that require considerable trimming. Carcasses normally yield 47 to 50 per cent of their weight in the four trimmed lean cuts.

U. S. No. 3: Slaughter hogs that are decidedly overfat and produce carcasses with a low proportion of lean and a high proportion of fat. Many cuts have large amounts of internal fat remaining even after heavy trimming of external fat. Yields of the four lean cuts are usually less than 47 per cent of carcass weight.

Medium: Hogs which are slightly underfinished and produce soft cuts with little or no marbling or other desirable quality characteristics. Although yields of lean cuts are relatively high, the ratio of total lean and fat to bone is slightly low.

Cull: Hogs which are decidedly underfinished and produce cuts of very inferior quality.

Plentiful Foods MONTHLY LIST

The following list of foods expected to be plentiful in July has been released by the U. S. Department of Agriculture:

Feature foods

Ice cream
Potatoes

Protein foods

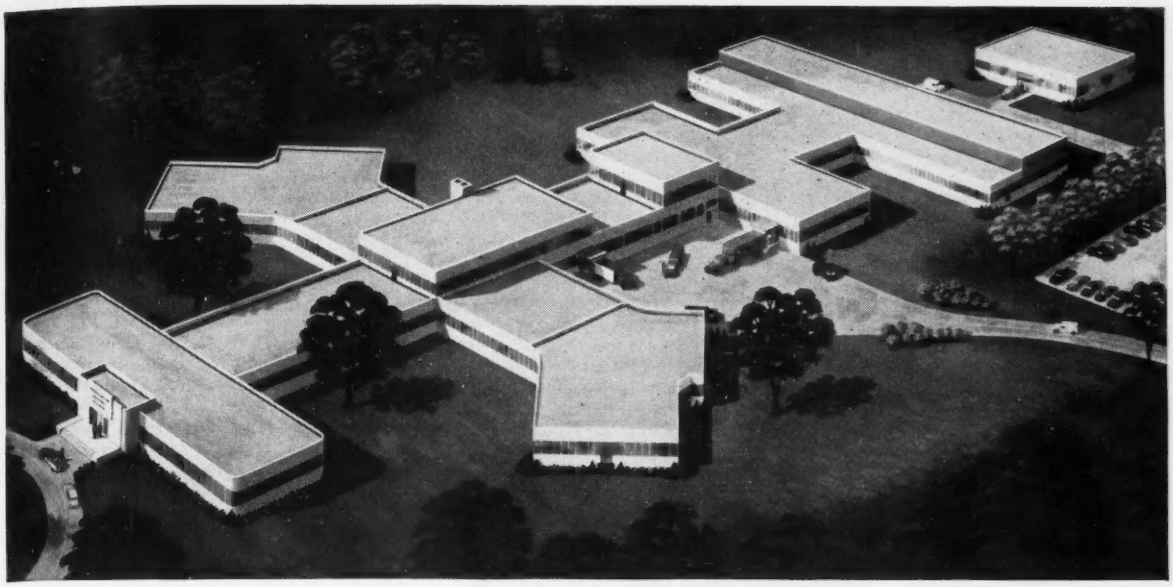
Beef
Chickens—broilers and fryers
Halibut—fresh and frozen
Milk and other dairy products

Other foods

Lard
Lemons—fresh and processed
Limes—fresh and processed
Prunes—dried
Rice
Vegetable fats and oils
Vegetables, summer
Watermelons

Workshop on Human Relations. August 3, 4, and 5 will be the dates of a workshop on human relations for which the California Dietetic Association is cooperating with the University Extension and Department of Home Economics, University of California at Los Angeles. The workshop will bring the newest findings and methods to bear on human relations problems confronting the dietitian in her work situation. Topics which will be covered include: how to supervise more effectively; how to be a more effective member of a staff team; how to develop staff talent; and how to overcome resistance to change. It is planned that each participant will be a member of a small training group where specific human relations problems will be discussed and some of the skills necessary to handle such problems will be practiced. Further information may be obtained from the Department of Conferences and Special Activities, University Extension, University of California, Los Angeles 24.

American School Food Service Association. Dr. John N. Perryman has recently been appointed Executive Secretary of the American School Food Service Association. He assumed office May 1 in Denver. Dr. Perryman, who



American Can Company opens world's largest container research center

Dedicated to adding convenience to America's future

American Can Company, leader in food and container research for nearly 50 years, has opened a multimillion-dollar Research and Development Center at Barrington, Illinois. Located on a 40-acre wooded tract some 40 miles northwest of Chicago, the new laboratory is equipped to give even greater emphasis to Canco's extensive scientific program for advancement in canning and packaging technology.

Since 1906 when it established the country's first container research center, Canco has continuously expanded its research efforts. Through the Canco laboratories have come such important developments as the vacuum pack coffee can, the reclosable shortening can, fibre and metal cans for dry food products, beer and carbonated beverage cans, and the single-trip paper milk container.

Canco research also has pioneered in the development of processing and packaging techniques. Safe processes for canned foods were established on a scientific basis many years ago. Similar laboratory studies have proved that canned foods are excellent sources of the nutrients essential to a balanced diet.

In their new laboratory, Canco scientists will continue to study new methods which may further improve the flavor, color, texture and nutritive values of packaged foods.

Containers to help people live better

AMERICAN CAN COMPANY

CANCO

New York, Chicago, San Francisco

graduated from the University of Colorado and received his doctorate from Syracuse University, brings to the post a background of professional education, business, and public relations experience. Until joining the Association, Dr. Perryman was charged with convention responsibility of the Denver Convention and Visitors Bureau. His new duties and responsibilities will include: editor of the news, advertising management, exhibits management, convention management as directed by the president, and public relations.

Government Publications. "Do You Get Enough Milk?" is the title of a new U.S.D.A. booklet which answers questions frequently asked about kinds of milk and milk products on the market and how to buy and use them. Special sections tell: why you need milk, how much milk is enough, how to estimate milk you get in meals, place of milk in diets for losing or gaining weight, milk and a tight food budget, importance of using pasteurized milk, definitions of milk labels, and care of milk at home. Single copies of the booklet, which is Home and Garden Bulletin No. 47, may be obtained on request from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C. It is also on sale at the Government Printing Office, Washington 25, for 5 cents a copy.

U. S. Food Exhibit Abroad. The U.S.D.A. has announced that plans are underway for a United States food exhibit at the "ANUGA" International Food Fair in Cologne, Germany, October 1 to 9. The U. S. exhibit, sponsored jointly by agricultural trade groups and the U.S.D.A., will be designed to promote sales of U. S. food products abroad. Private U. S. food exhibitors interested in developing new and broader markets for their products overseas are being invited to participate in the exhibit. The Cologne Food Fair, one of the largest held in Europe, is devoted largely to processed food and food packaging exhibits, drawing trade representation from all parts of the Continent. Further inquiries about the exhibit or participation in it should be directed to: International Trade Fair Staff, Foreign Agricultural Service, U. S. Department of Agriculture, Washington 25, D. C.

Interns Graduate. On June 30, four dietetic interns completed their year's work at the Aetna Life Insurance Company, Hartford. They are: Grace Vogt Johnson, University of Texas; Doris Koker, University of Kansas; Marilyn Lundvall, University of Georgia; and E. Ann Stone, Macdonald College.

Army Personnel Announcements. The following changes in dietetic personnel of the Women's Medical Specialist Corps of the Army have been announced:

PROMOTIONS

2nd Lieutenant to 1st Lieutenant

Carol J. Andrews
Eileen L. Billick
Helen Collins
Mildred A. Duomi
Betty A. Estrada
Margaret A. Fairbrother
Phyllis Horning
Anita I. Hutchison
Patricia McGrew
Joanne McNally
Mary L. Mudra
Sarah A. Pankonin
Mary Lou Pate
Shirley Petersen
Dorothy Regan
Marilyn Schmechel
Ruth Siegfried
Elaine Sterling
Eva Ellyne Strickland
Betty L. Vannoy
Jane Vawter
Irma Weltman

SEPARATIONS

Regular Army Retirement

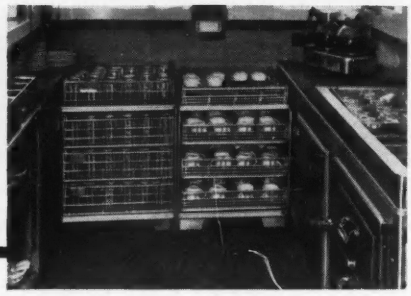
Maj. Helen A. Dautrich

Reserve Officers Relieved from Active Duty

Capt. Mary L. Davidson
Capt. Mildred F. McElreath
Capt. Marion E. Jones
1st Lt. Iris J. Cox
1st Lt. Joann M. McIntyre
1st Lt. Elizabeth H. Ivy

Macadamia Nuts in California. The macadamia nut, a native of Australia which has been commercially cultivated in Hawaii for some thirty years, is now being tested in Southern California as a possible replacement crop for avocado orchards which have been ruined by root rot. The macadamia tree has a high resistance to the root rot.

341,000 CUSTOMERS SERVED...



only 186 broken cups

How much is chinaware breakage costing you? Would you like to cut your loss to less than 1/4 of one per cent?

That's what the "Poodle Dog" Cafe in Tacoma, Washington has done, year after year, since they installed their Sani-Stack® Rack system. (In one year only 144 glasses were broken).

The Sani-Stack® system for dish, cup and glass handling not only saves thousands of dollars by reducing breakage, it also reduces noise and waste motion to a minimum, improves sanitation, saves labor, time and storage space.

If breakage is putting a big hole in your profits, send coupon for bulletin "Save Dollars With Sturdy Racks," and full information about the Sani-Stack® dish handling plan. They are FREE. Start cutting your china and glass breakage TODAY.

25 years of Service to the Food Service Industry — Sold Through better Restaurant Equipment Dealers Everywhere.

Metropolitan **WIRE GOODS CORPORATION**
70 Washington Street, Brooklyn, N. Y.

Please send FREE bulletin "Save Dollars With Sturdy Racks," and full information about the Sani-Stack Plan.

Name.....Title.....

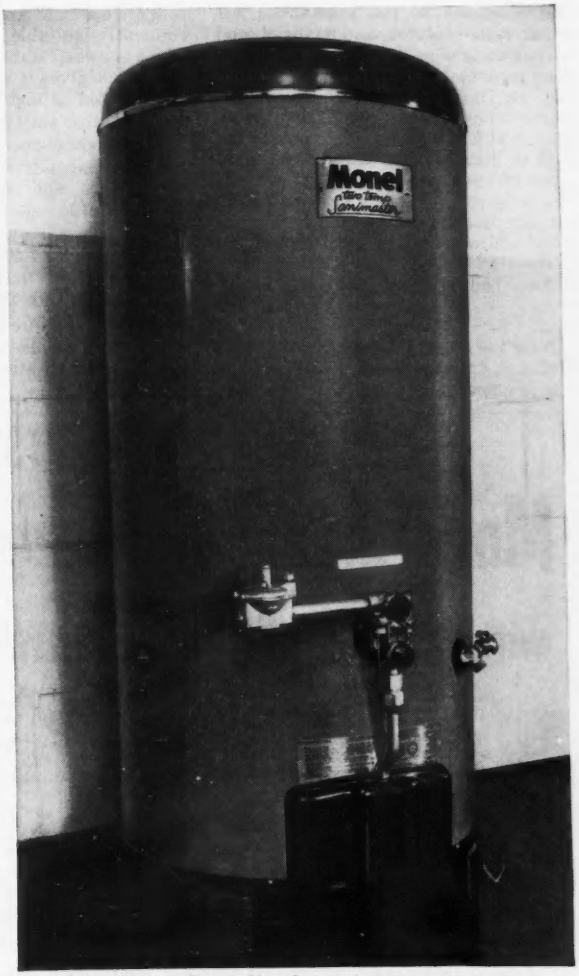
Address.....

City.....State.....

JADA

180° Sanitizing Hot Water delivered to washers at full flow rate recommended by the National Sanitation Foundation. Aids in air-drying dishes — eliminates costly hand-toweling.

140° General-Use Hot Water is always on tap at the hot water faucets. Meet your code requirements with the Monel Sanimaster. Requires less than 1 sq. yd. One man installation.



Ruud-Monel and Crane-Monel two-temp Sanimaster 80-80 provides low maintenance through minimum controls. Operates on all gases. Sanimaster Water Heaters are sold only by Ruud Manufacturing Company and Crane Co.

For { economical dishwashing... rust-free water... constant 180° sanitizing rinse... great, wear-resisting strength... long life...

look for the Monel label on the water heater you buy

You'll get no rust from these modern Sanimaster gas water heaters. Their tanks are solid MONEL®.

But you do get plenty of sparkling clean hot water . . . at the two temperatures you most need. 180° *sanitizing* hot water for dish-rinsing. 140° *regular* hot water at pot sinks, faucets and lavatories.

Strong, wear-resistant MONEL . . . the solid, high-nickel alloy, long-life metal tank . . . is highly corrosion-resistant and rust-proof at *all* temperatures.

The Sanimaster is a self-contained water heater, without coils. It gives an unrestricted flow of 180° water for the sanitizing rinse. This air-dries dishes, thus eliminating costly hand-toweling.

Be sure to specify either the Ruud-Monel or Crane-Monel *two-temp* Sanimaster. Send in the coupon . . . for details.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N.Y.

The International Nickel Company
Dept. JAD 7-55
67 Wall St., New York 5, N. Y.

INCO TRADE MARK

Please send detailed information on Monel Sanimaster Automatic Gas Water Heaters.

☐ Literature only
☐ Have a representative call

Name_____

Name of Establishment_____

Street_____

City_____ State_____

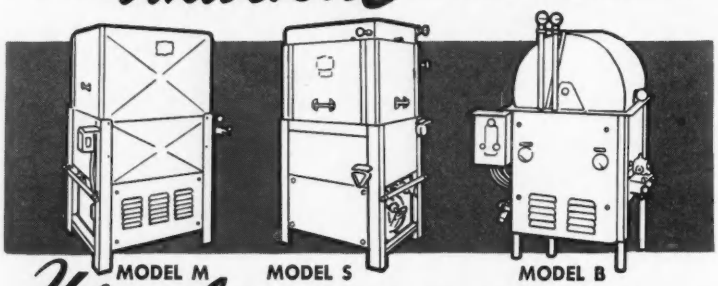
The nutmeats of the macadamia are round, cream-colored, and flavorful, and contain up to 65 or 70 per cent oil, making them comparable to the pecan or Brazil nut. In Hawaii, where they have acquired considerable popularity, macadamia nuts are sold in glass jars in the shelled, roasted, and salted form. Two types of trees are being tested in California—one, which bears a rough-shelled nut that matures during the fall, and the other (a Hawaiian type), which produces a smooth shelled nut which blooms almost continuously throughout the year.

New Very Early Apple. The Courtland and Crimson Beauty apples have been crossed to produce the "Wellington." This new apple is described as eminently suitable for making sauce which is golden amber and has the coarse grain that gives it desirable texture. It is not rated as high as an eating apple as many other varieties. The new variety has the advantage of bearing every year, instead of in alternate years as many varieties do, and matures early in the season. Unlike most early apples, the Wellington ripens evenly so that the crop may all be picked at one time. The fruit is described as "large, handsome, and red-streaked." Developed by the New York State Experiment Station, Geneva, it is now being distributed for growing in New York State and tests in other areas.

FOR GREATER PROFITS

Modernize and Mechanize

with *Universal* DISHWASHERS



MODEL M MODEL S MODEL B

Universal dishwashers pay for themselves

As competition becomes keener the need to modernize and mechanize your dishwashing system becomes greater. For whatever your dishwashing system requires, you will find a "right type" model in the complete line of Universal commercial type dish, glass and silver washing machines.

Universal offers 31 models. The most complete line with most-wanted features. The best values in dishwashers today and all these extra improvements.

• 50% Better and faster dishwashing with double action "Swing Wash." Dishes swing back and forth under power wash sprays. The constantly changing water pattern doubly covers dishes from all angles. An exclusive Universal improvement.

• Built-in 180° final rinse water Booster; gas, electric or steam operated. Saves installation cost.

• Automatic timed wash and rinse control units. Simple in construction. Positive in operation. Insure uniform results with less labor.

For latest and best information on modern "cost-saving" dishwashing layouts, consult your Universal Dishwashing Machinery dealer or write to us for full information.

Write for Complete Catalog

Universal DISHWASHING MACHINERY CO.

COMMERCIAL TYPE UNIVERSAL DISHWASHERS

53 WINDSOR PLACE, NUTLEY 10, NEW JERSEY

World's Largest Exclusive Producer of Commercial Type Dish, Glass and Silver Washing Machines

Chicken Flavor after Ice Water Chilling. Many processors immerse dressed whole chickens in a tank of slush ice or ice water to chill the carcasses in preparation for freezing or refrigerated shipment and storage. At the U.S.D.A. Western Regional Research Laboratory, Albany, California, scientists say that this practice does not noticeably affect the flavor of the meat. However, prolonged holding of chicken in cold water is detrimental to maintenance of top flavor and should be avoided. Recent tests showed that commercial methods of slush-ice chilling do not normally result in detectable loss of flavor in chicken that is later fried or roasted. There was a noticeable deterioration of flavor in broth made from chickens immersed in ice water for 3 hr. compared to birds which were air-chilled.

News of State Associations

Connecticut Dietetic Association. The spring meeting of the Connecticut Dietetic Association was held May 3 in New Haven. Featured speakers and their subjects were:

"Progress Report on Training Courses for Food Service Supervisors in Connecticut"—Lucille M. Refshauge, Director of Dietetics, Hartford Hospital

"The Food Service Supervisor's Training Course"—Isola D. Robinson, Dietetics Specialist, American Hospital Association, Chicago

"What Do You Have in Your Wagon?"—Martha Nelson Lewis, Director, Department of Dietetics, Ohio State University Hospital, Columbus

Earlier, on April 21, the Diet Therapy Section of the Connecticut Association co-sponsored a Diet Therapy Institute at Grace-New Haven Community Hospital, New Haven. The program included buzz sessions and the following papers:

"Advances in Diet Therapy in Gastroenterology"—Howard M. Spiro, M.D., Yale University School of Medicine

"The Practical Operation of a Metabolic Project"—Mark A. Hayes, M.D., Ph.D., Yale University School of Medicine, and Ann M. Everson, Research Dietitian, Grace-New Haven Community Hospital

"Dietary Management of Patients Receiving Adrenal Steroid Therapy"—Robert E. Cooke, M.D., Yale University School of Medicine

"Psychologic Approach to Diet Therapy in Obesity"—Stephen Fleck, M.D., Yale University School of Medicine

"Current Trends in Diet Therapy"—Doris Johnson, Ph.D., Yale University School of Medicine

District of Columbia Dietetic Association. The theme of the March meeting of the District of Columbia Dietetic Association was "Educating Ourselves." The buzz-session technique was used for this meeting, with those attending divided into four groups to discuss: civil defense, low-sodium diets, weight guidance, and the evaluation of food supplements and their uses.

Meat...

and Biologic Facts of Protein Metabolism

The classical work of Cannon and his associates* in the field of protein metabolism has contributed significantly to our knowledge of the biologic utilization of protein. It has established that the dietary absence of a single amino acid quickly changes the direction of metabolic activity from anabolism to catabolism. Apparently all the nonessential amino acids play some part in sparing the essential amino acids, and all may be regarded as indispensable for optimal nutrition. It has been suggested "that for maximal tissue-utilization of amino acids at least twenty per cent of the total dietary nitrogen should come from other sources than essential amino acids."

In undernourished subjects the maintenance requirement for each essential amino acid is much greater—two to almost five times greater—than in healthy subjects.

Although an optimal caloric intake facilitates optimal utilization of amino acids, a reducing regimen need not curtail full utilization of these nutrients. It has been shown that a useful degree of amino acid utilization can be attained with caloric intake considerably below the optimal.

Minerals appear to be important in the process of amino acid metabolism. Evidence indicates that either phosphate or potassium deficiency might adversely influence amino acid utilization. Absence of either ion from experimental depletion rations leads to depression of appetite and slowing of the processes of protein repletion.

B complex vitamins also affect the metabolism of proteins and amino acids. For example, rats fed a high protein diet require a high intake of B complex vitamins in order to maintain normal growth rates. Omission from the ration of any one of these vitamins (riboflavin, thiamine, pyridoxine, or pantothenate) is accompanied, in varying degrees, by lower food consumption and slower weight gain.

Meat of all cuts and kinds is high in its content of protein, and provides well proportioned amounts of essential and nonessential amino acids. Meat also supplies valuable amounts of essential minerals, especially iron, phosphorus, potassium and magnesium, as well as important quantities of all components of the vitamin B complex, thus assuring maximal utilization of the amino acid components.

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*Cannon, P. R.; Frazier, L. E., and Hughes, R. H.: Factors Influencing Amino Acid Utilization in Tissue Protein Synthesis, in Symposium on Protein Metabolism, New York, The National Vitamin Foundation, Inc., 1954, pp. 55-90.

The nutritional statements made in this advertisement have been reviewed and found consistent with current medical opinion by the Council on Foods and Nutrition of the American Medical Association.

American Meat Institute
Main Office, Chicago . . . Members Throughout the United States

Illinois Dietetic Association. Considerable interest in Civil Defense has been stimulated in Illinois through the efforts of Pearl Camstra, Chairman of Civil Defense Committee for the Illinois Dietetic Association. In March, Mrs. Camstra spoke to the Urbana-Champaign dietitians. Later in the spring, she also addressed the Illinois Nutrition Committee. Several downstate counties have invited her to speak about emergency mass feeding in the fall, and requests have also been made from Chicago suburban areas.

Massachusetts Dietetic Association. In May, the Massachusetts Dietetic Association cooperated with other Massachusetts medical and health services in a unique exhibit staged in the Grand Foyer of the State House in Boston. More than forty national and state health agencies and organizations exhibited displays portraying the services available to citizens of Massachusetts and which made significant contributions to world health. The exhibit was opened by Governor Herter on May 10. During the seventeen days of the exhibit, special arrangements were made for guided tours by organizations and school children.

Michigan Dietetic Association. Michigan dietitians met at Michigan State College on April 27 and 28 for their annual spring meeting. The program featured the following speeches and papers:

Recent Scoops in Food
- "What's New in Meats"—Lyman J. Bratzler, Associate Professor of Animal Husbandry, Michigan State College
- "What's New in Poultry"—Lawrence E. Dawson, Ph.D., Associate Professor of Poultry Husbandry, Michigan State College
- "Freezing of Precooked Foods"—Mildred Jones, Associate Professor of Institution Administration, Michigan State College

Layout and Equipment—a panel discussion

"Personnel Training"—Bill Knapp, President, Bill Knapp Restaurants, Battle Creek and Lansing

"My Role in Professional Ethics"—Margaret A. Ohlson, Ph.D., Head, Department of Foods and Nutrition, Michigan State College

"The Dietitian in the Community—Opportunities for Service"—Hugh B. Robins, M.D., Director, Calhoun County Health Department, Battle Creek

"Professional Dividends"—Mary Reeves, Children's Bureau, Department of Health, Education, and Welfare, Chicago

"Non-Dietary Aspects of the Low-Sodium Diet"—F. S. Leeder, M.D., Michigan Department of Health, Lansing

"The 'Forward Look' in 1955 Model Food Cost Control"—Pearl Jackson Aldrich, Ph.D., Michigan State College

Minnesota Dietetic Association. Minneapolis was the scene of the annual spring meeting of the Minnesota Dietetic Association, May 12 and 13, held in conjunction with the Midwest Hospital Conference. Highlights of the dietetic portion of the program included:

"The Dietitian Improves Her Public Relations"—Marjorie Husted, Public Relations Consultant, Minneapolis

"Food Sanitation and/or the Infectious Process"—Richard Bond, Students' Health Service, University of Minnesota, Minneapolis

"Impact of Audio-Visual Aids on Learning"—Neville Pearson, University of Minnesota, Minneapolis

Reports were also given of the Weight Control Colloquium at Iowa State College, a workshop on nutrition in the basic nursing curriculum, and the use of "Self-Appraisal Methods," suggested by A.D.A.

New York State Dietetic Association. Meetings of the Rochester Dietetic Association have been held monthly in 1955. Included on the programs have been a presentation on "Psychologic Aspects of Nutrition of Children" by Dr. Albert Sullivan, University of Rochester Medical School"; and a talk on "Care of Food Before and After Preparation" by Milton Bidwell, Rochester Health Bureau . . . The Diet Therapy Section of the Rochester group is cooperating with the American Red

Fancy this... on a sugar-restricted diet!

sweeten it with SUCARYL®

(Save ⅓ the calories*)

The only thing missing in this old-fashioned Coffee Cake is a lot of the calories. That's because you use SUCARYL® (Cyclamate, Abbott), instead of sugar. Calorie-free SUCARYL bakes right in, sweetens wonderfully like sugar, won't turn bitter on you. Here's all the matchless fragrance and flavor of hot bread, all the fresh sweetness. Serve right from the oven!

Abbott

LOW CALORIE COFFEE CAKE

¼ cup skim milk
½ cup butter or margarine
1 teaspoon salt (optional)
1½ teaspoons SUCARYL solution or 12 tablets, crushed
2 pkgs. active dry yeast
½ cup lukewarm water
2 eggs, beaten
2½ to 3 cups sifted enriched flour
½ cup chopped walnuts

Scald milk, add butter, salt and SUCARYL; stir until butter is melted. Cool to lukewarm (70°—90°F.). Dissolve yeast in warm water; add to milk mixture. Add beaten eggs and flour; mix well. Spoon into greased 9-inch square cake pan. Let rise, covered, in warm place until double in bulk. Scatter chopped walnuts over top with sprinkling of powdered SUCARYL and cinnamon. Bake in hot oven, 400°F., 20 minutes. Makes 9 servings.

*Made with SUCARYL—201 calories; with sugar—303 cal.

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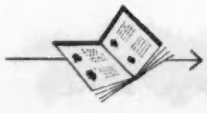

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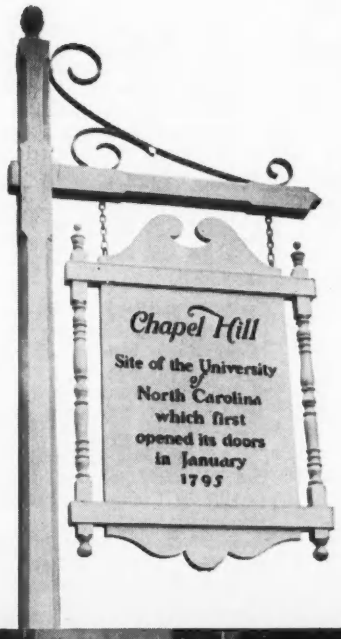
"Calorie Saving Recipes"—at pharmacies everywhere!



UNIVERSITY OF NORTH CAROLINA REPORTS:

Seven years of satisfactory service . . . plus very substantial savings — with smart, break-resistant melmac® dinnerware

Before MELMAC dinnerware was employed in the cheerful, modern cafeterias of the University of North Carolina, replacement costs ran to $12,000 annually, silverware included. Now, with MELMAC dinnerware, the University has cut replacement costs to a mere $2,500 annually—a total saving of over $65,000 in the past seven years—while serving an average of 6,000 meals per day!

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Cross unit to develop an outline of modified diets for low-income families. Several members of the Association have also served as instructors for the Red Cross weight control classes. . . Officers of the Rochester Dietetic Association for 1955 will be: President, Ferne King, Rochester Institute of Technology; President-Elect, Eleanor Fordyce; Vice-President, Jean Fox, Rochester General Hospital; Treasurer, Martha L. Barmes, Eastman Kodak Company; and Secretary, Claire Anwyl, R. T. French Company.

Oregon Dietetic Association. The Oregon Dietetic Association held its annual spring meeting May 6 and 7 in Portland. At the dinner meeting on May 6 a scholarship award was presented to Anne Murray, Oregon State College. Administrators of the hospitals in Portland and nearby areas were the dinner guests.

The program also featured:

"Problems of Recruiting Dietitians"—a panel discussion

"Dental Research"—Dr. Francis V. Howell, Head, Department of Oral Pathology, University of Oregon Dental School

"What's Cooking"—Barbara Angel, Home Economist, TV station KPTV

"Present and Future City Plans for the City of Roses"—Lloyd T. Keefe, City Planning Director

Tennessee Dietetic Association. The Memphis Dietetic Association this year conducted the Fairfax T. Proudfit Essay contest as a means of interesting high school seniors in Memphis in dietetics. The first prize was a $50 savings bond plus a trip to Chattanooga for the Tennessee Dietetic Association meeting on May 20. Runners-up had their choice of a $10 honorarium or a trip to Chattanooga.

Texas Dietetic Association. The annual meeting of the Texas Dietetic Association was held in Houston, April 28 through 30. The program included:

"The Atom and Its Relation to Food and Medicine"—Dr. Herbert Allen, Director, Radio-Isotope Laboratory, VA Hospital, Houston

"The Distributor's Role in Institutional Food Services"—Ruth Kahn, Pfaelzer Brothers, Chicago

"The Selective Menu, Its Use in Modified Diets"—Marguerite Pettee, University of Colorado Medical School, Denver

"Let's Eliminate Some of the Paper Work"—Agnes Bannister, Chief, Dietetic Service, VA Hospital, Houston

"The Role of the Shared Dietitian"—Charlotte Dent, Marshall, Minnesota

"The News in Meat Fabrication"—"Red" Sullenger, Select Meat Company

"What's New in Frozen Food?"—John Baugh, Zero Frosted Foods

"What's New in the Bakery Industry?"—John Mock, Mrs. Tucker's Shortening, Sherman, Texas

"The Menu Cycle"—Tony Bracher, Director of Food Service, Sakowitz Brothers

The Diet Therapy Section of the Texas Dietetic Association recently completed work on a new diet manual, which is planned primarily for institutions which do not employ qualified dietitians. In line with current thinking, the number of modified diets has been limited. For most of the diets, an outline is followed which includes: essential foods to be included daily, other foods allowed, and foods to be avoided. For some of the diets, tables of composition are presented. One section is devoted to "Sources of Essential Dietary Constituents," in which foods are listed together with household measure, weight in grams, and the amount of the nutrient being considered. Final compilation and editing of the book was done by Frances Low, Director of Dietetics, The Methodist Hospital, Houston.

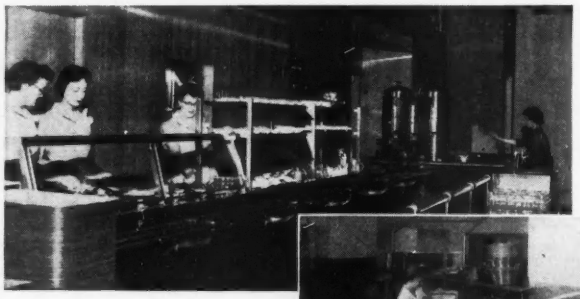
Virginia Dietetic Association. April 1 and 2 were the dates of the annual spring meeting of the Virginia Dietetic Association held in Richmond. Some of the speakers and their subjects were:

"Good Nutrition for What?"—Dr. George Kalif, Director, School of Social Work, Richmond Polytechnic Institute

"The Clinical Picture"—Dr. Robert Markelz, Army Medical Service, Graduate School, Washington, D. C.

"Dietary Aspects"—Elizabeth Lounds, Medical College, Richmond

"Emergency Feeding Know How"—



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Virginia Love, Medical College, Richmond

The John G. Kolbe Memorial Award to the most outstanding dietitian in the state was presented to Margaret Fitzhugh, Director of Cafeterias, Richmond Public Schools. Miss Fitzhugh is the first to receive this honor.

Association Activities

New Publications and Reprints List. In May, a new A.D.A. "Publications and Reprints List" was printed. Recent articles and materials included will be of interest to dietitians and nutritionists. Singe copies of this List may be requested from A.D.A. Headquarters office at no charge.

Shared Dietitians. Concerned about the difficulty of small hospitals to provide adequate nutritional care for patients, the Joint Committee of the American Hospital Association and The American Dietetic Association is sponsoring a project to further the use of shared dietitians. This pilot study is being carried out in Indiana by the following organizations: Indiana Hospital Association, Indiana Medical Association, Indiana State Board of Health, and Indiana Dietetic Association.

State dietetic associations wishing to consider sponsoring a shared-dietitian project may write to the Headquarters office for a packet of materials prepared for the Indiana Committee.

Of interest, also, will be the articles:

"Needed by Small Hospitals: The Shared Dietitian" by Thelma Pollen. JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION, September 1954—reprint, 10 cents

"The Shared Dietitian" by Betty Hoover. JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION, April 1955—reprint, 10 cents

"The Answer to a Dilemma—the Shared Dietitian" by Thelma Pollen. *Hospitals*, May 1954

"Shared Supervision Makes One Equal Two" by Thelma Pollen. *Institutions Magazine*, March 1955

"Can a Shared Dietitian Help You?" by Betty Hoover and associates. *Hospitals*, July 1955

Mental Health. A series of articles pertaining to food service in mental institutions was published in the May 1955 issue of the JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION and consists of the following:

"The Dietitian's Contribution in the Care of the Mental Patient"—Hilding A. Bengs

"Nutrition in Mentally Deficient Children"—Gale H. Walker

"Administrative Problems in a Large Hospital System"—Katherine E. Flack

"A.D.A. and American Psychiatric Association Cooperate"—Clarice D. Gullickson

A compilation of these four articles may be obtained as reprints from A.D.A. Headquarters office at a total cost of 25 cents.

A.D.A. Seal. The A.D.A. Seal with its explanation has been reproduced on a 4 by 9⅜ in. card and is available from A.D.A. Headquarters office. The cost is 5 cents a copy. It is planned that each member will receive a copy in a forthcoming mailing, and that hereafter, it will be sent to each new A.D.A. member.

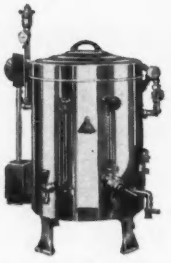
Annual Meeting Exhibition. The prospectus for this year's 258-booth exhibition during our 38th Annual Meeting in St. Louis was released April 1. Since that date 90 per cent of the space has been sold.

Program for 38th Annual Meeting. The Program Planning Committee for the 38th Annual Meeting to be held in St. Louis, October 18 through 21, 1955, met in Chicago on June 3 to review and crystallize plans for the program. A tentative copy of the program will appear in the September JOURNAL.

A.H.E.A. Meeting. The new lightweight exhibit, "You Can Lose Weight Safely and Pleasantly" was shown at the meeting of the American Home Economics Association in Minneapolis, June 28 though July 1. Members of the Minnesota Dietetic Association served as booth attendants, under the chairmanship of Margaret O. Comstock.

How good can a cup of coffee be?

only AMCOIN users know—



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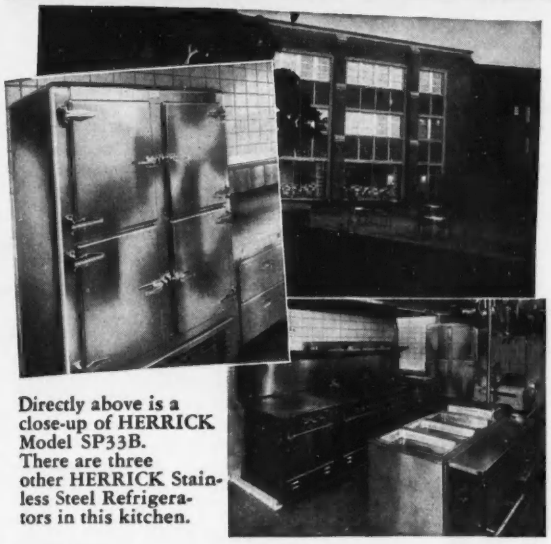

Directly above is a close-up of HERRICK Model SP33B. There are three other HERRICK Stainless Steel Refrigerators in this kitchen.

Top picture is an exterior view of the new addition to The Menninger Foundation, showing the patio and main dining room. This HERRICK-equipped hospital won a First Award in this year's Institutions Magazine's Food Service Contest. Directly above is a general view of the kitchen. Architects for the new addition were Griest and Ekdahl, Topeka, Kansas. HERRICK units were supplied by Smith St. John Manufacturing Company, Kansas City, Missouri.

Dedicated to the improvement of mental health, The Menninger Foundation in Topeka, Kansas has grown from a private medical partnership to a professional organization employing some 400 persons. Its staff members hold important positions in national and international psychiatric organizations. ● The award-winning kitchen, located in the hospital's new wing, is equipped with HERRICK Stainless Steel Refrigerators. When it comes to keeping foods fresh and flavorful, nothing equals a thoroughly-dependable HERRICK. You, too, will find HERRICK Refrigerators unmatched for complete food conditioning at lowest cost per-year-of-service. Write for nearest HERRICK supplier.

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Obituaries

Ellen Pennell. On May 23, Ellen Pennell, Associate Professor of Technical Journalism (Home Economics), Iowa State College, died at Ames, Iowa. Miss Pennell had been on the editorial staffs of *Successful Farming* and *Country Home* magazines, and from 1940 to 1944, she was Home Service Director of National Biscuit Company, later serving as Director of the Ann Pillsbury Home Service Department of Pillsbury Mills, Inc., Minneapolis. She joined the Iowa State faculty in 1950. Miss Pennell had been a member of The American Dietetic Association since 1931. An Ellen Pennell Memorial is being established through a home economics journalism research fund at Iowa State College. Contributions from friends and associates are being solicited.

Margaret T. Sullivan. Word has been received in the Association office of the death on May 13 of Margaret T. Sullivan, who was on the dietary staff of Harper Hospital, Detroit. Miss Sullivan who was killed in an auto crash, had been a member of A.D.A. for two years.

News of Products and Services

On May 26, *American Can Company* dedicated its new Research and Development Center in Barrington, Illinois. The ceremonies were marked by the cutting of a ribbon of tinless metal to symbolize the part which Canco scientists are playing in developing containers of tin-free materials. More than two hundred visiting scientists from sixty universities and industrial laboratories throughout the country spent the day touring the new facilities which include some fifty-odd specialized laboratories and testing areas. Scientific equipment designed to test and develop new metals was demonstrated, including a giant X-ray microscope and an electronic spectrophotometer capable of identifying more than a million different shades of color. Other facilities of the Center include food testing, bacteriologic, and biochemical laboratories and controlled-temperature storage rooms in which containers filled with test packs of food and other products can be subjected to conditions ranging from tropical heat to arctic cold. A miniature cannery and food-formulation kitchen, in which the preparation and canning of all types of food products are carried out on a pilot-line basis, will facilitate the development of new and improved containers for commercial canneries. The dedication program was concluded at a dinner-meeting at downtown Chicago, with Secretary of Agriculture Benson as guest of honor and principal speaker.

Waring Products Corporation has developed a new gallon-size Blendor for use in hospitals and nursing homes. The stainless steel blades of the Blendor whirl up to 16,000 r.p.m. and will purée, blend, pulverize, macerate, and homogenize all kinds of foods. It is especially efficient in preparing liquid diets for patients requiring tube feeding. The motor has five speeds. The food container is of stainless steel and can be easily removed for emptying and cleaning. The white enamel, die-cast base, which contains the motor, can be permanently fastened to a working surface.

Evaporated Milk Association has published a booklet titled *Tested Recipes for 50 and 100 Servings*. The recipes included were developed by Fern Gleiser, A.D.A. President, and Alice F. Teasdale, Assistant Professor in Institution Economics and Management, University of Chicago. The recipes, using evaporated milk, were planned not only for flavor and appetite appeal; consideration was also given to cost of ingredients, labor, and equipment needed. The recipes may be kept in the booklet or cut out along guide lines for use in a 5 by 8 in. card file.

The Nutrition Service of the *Ralston Purina Company* has just issued a new edition of its child's coloring book, *Happy Days Together*. The book is built around a television motif and a pair of twins; its twelve pages to color emphasize desirable attitudes and good health practices. It is available in quantity to physicians and dentists to use as gifts for young patients, and to dietitians and teachers for use with children three to eight years of age.

Another Ralston publication, *Breakfast Around the World*, a sixteen page booklet in color, has recently been reissued after being out of print for several

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The meal-planner's best friend! . . . Anywhere meal-planning is a problem, Maggi's Granulated Bouillon and Maggi's Seasoning can be a big, BIG help.

Coaxes out hidden flavor! . . . Maggi's Seasoning is a highly concentrated cooking aid that multiplies and emphasizes the natural taste of food. Makes meats, casseroles, gravies, stews taste marvelous! Maggi's Granulated Bouillon Cubes dissolve instantly, add appetizing, meaty flavor.

Economical, easy to use! . . . Naturally, Maggi's cooking aids make low cost dishes taste better . . . transform leftovers into treats, all in a few seconds time! So keep these world-famous products—Maggi's Seasoning and Maggi's Granulated Bouillon Cubes—always on hand!

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Maggi's Seasoning and Maggi's Granulated Bouillon Cubes are high in protein, low in calories. Extremely easy to digest . . . even more digestible than simple foods such as toast. (Not recommended for salt-free diets.)

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VALUABLE FOOD PLANNING TIPS!
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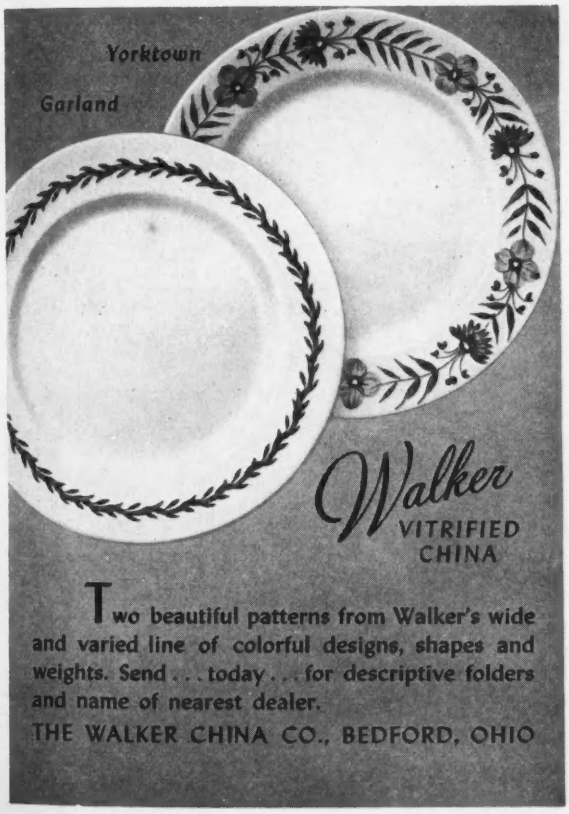

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For the patient on a high-protein diet, GEVRAL PROTEIN is an excellent supplement. In addition to 60% protein, it supplies 26 vitamins and minerals in a dry powder that can be added to many beverages and foods. Here are some suggested recipes:

simple drinks

Blend 1 heaping tbsp. GEVRAL PROTEIN with small amount of milk or orange juice; make smooth paste; stir in additional milk or juice to make 8 oz. For chocolate milk, prepare milk drink, then add 1-2 tbsp. chocolate syrup. For hot cocoa, add 1 heaping tbsp. GEVRAL PROTEIN to instant cocoa powder in cup; add small amount of hot water, make smooth paste; stir in enough water to fill cup.

special drinks

Vanilla Milk. 4 heaping tbsp. GEVRAL PROTEIN, 1 pint cool water, 1 cupful skim milk, 1 tbsp. sugar, ½ tsp. vanilla. Mix with rotary beater. Serve hot or cold. Makes 4 servings.

Chocolate Malted Milk. 1 heaping tbsp. GEVRAL PROTEIN, 1 tbsp. chocolate malt powder, 1 tsp. sugar, 1 glass whole milk. Mix with rotary beater. Makes 1 serving.

Egg Nog. 4 heaping tbsp. GEVRAL PROTEIN, 3 cups cool water, 1 tbsp. sugar, 2 well beaten eggs, ½ tsp. vanilla. Mix with rotary beater. Makes 4-5 servings.

other foods

Soups. Place 1 heaping tbsp. GEVRAL PROTEIN in saucepan. From ¾ cup of water, take enough to make smooth paste. Stir in remaining water, then ½ can of cream of mushroom, chicken, asparagus, or celery soup.

Cereals. One heaping tbsp. GEVRAL PROTEIN can be mixed with ½ cup hot cereal during or after cooking. Add sugar, milk, or cream to taste.

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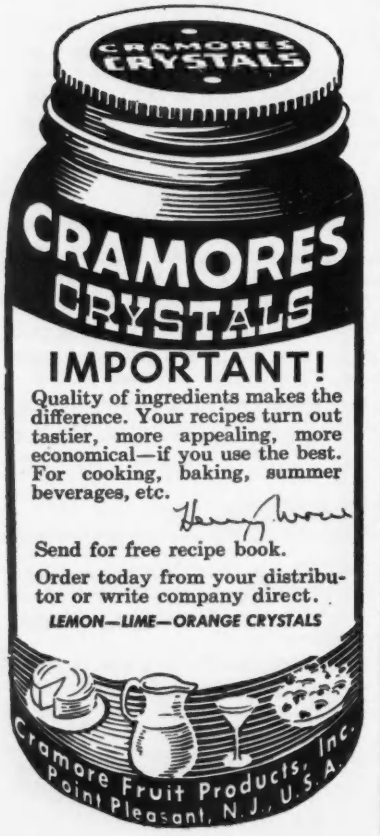
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Quality of ingredients makes the difference. Your recipes turn out tastier, more appealing, more economical—if you use the best. For cooking, baking, summer beverages, etc.
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LEMON—LIME—ORANGE CRYSTALS
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years. The booklet contains breakfasts of seven different peoples as well as information about the foods in the typical American breakfast. It is available in quantity to teachers and is suitable for grades four to seven.

United Fruit Company has published *Bananas—Recipes for Institutional Service and Menus* on 5 by 8 in. cards, which are inserted in a handy loose-leaf cover. The recipes included are not only some of the old favorites, such as banana cream pie, banana bread, and banana salads, but also unusual and delicious-sounding recipes such as ham banana rolls with cheese sauce, banana fritters, banana scallops, and banana dessert pancakes. Each card carries a full color illustration of the recipe on one side, with ingredients and instructions for three different quantities on the reverse side, one of which is a "trial size," yielding household-size quantities. The booklet also contains sections on sauces and toppings; menu suggestions; special information on bananas, which includes instructions on freezing banana bakery products; a guide for buying bananas; and a section on nutrition of bananas.

The *National Turkey Federation* will sponsor Midsummer Turkey Time, July 27 through August 7. The campaign will be concentrated mainly on institutions which account for a substantial part of the turkey consumed throughout the year. Midsummer Turkey Time will be coordinated with campaigns by two other organizations: "July Picnic Time," sponsored by the American Bakers Association, and "August Is Sandwich Time," sponsored by the Wheat Flour Institute.

Downyflake Baking Mix Division of Doughnut Corporation of America has introduced individually packaged quantities of its pancake and waffle mix. With the addition of cold water to the contents of one package, the proper quantity for one serving is ready for the griddle. Mixing takes only 10 to 20 seconds in a malted-milk type mixer. With this innovation, not only portion control but fresh batter is assured the food service operator. The individual packages come in boxes of twenty-four, designed for counter display to stimulate sales.

Standard Brands Inc. has introduced a new lemon-flavor Royal Pie Filling and Pudding. This filling is easy to make, reducing to a minimum the time ordinarily needed for preparation. Four formulas using the filling are shown on the label: lemon pie, lemon sponge pie, lemon rice pudding, and lemon bread pudding.

Starlac Division of *The Borden Company* is now packaging Instant Starlac in 3-gal. boxes. This development resulted from surveys which revealed that homemakers were buying two or more packages of nonfat dry milk at a time. The new package was market-tested in Portland, Oregon, and later in the remainder of the state, and is now widely available west of the Mississippi. Distribution in the East will proceed as rapidly as possible. By using the new package, the cost of nonfat milk can be reduced to approximately 7 cents a quart.

Mead Johnson & Company has published a new recipe booklet containing a variety of milk-free dishes for children and adults who are allergic to milk. Featuring uses for Mead's Liquid Sobee as a substitute for milk, the thirty-nine recipes cover a large range of foods.

Edward Don & Company presented the millionth Don measuring glass at the National Restaurant Show in Chicago. This souvenir has been given away at every convention in which *Edward Don & Company* has participated since 1942. The millionth glass, mounted on a pedestal and bearing an engraved plaque, was presented with considerable fanfare to Mr. and Mrs. Stanley J. Kowalski of Scottie's Seafood House, Grand Rapids, Michigan. They received, in addition, a "jackpot" of more than fifty prizes.

"Fats and Your Diet" is one of two new booklets published by the *National Association of Margarine Manufacturers.* This booklet tells how fats aid in digestion, act as "vitamin carriers," and help in distributing energy in the body. The relationship of fat to obesity, and the make-up of a good diet are discussed. The booklet is illustrated for easy readability.

"Cooking for a Crowd with Margarine" is another new booklet available from the *Mbrgarine Association.* Twenty-four quantity recipes feature main dishes as well as desserts, breads, and toppings.

More than 2500 cups of coffee can be made in a single brewing with an all-stainless-steel institutional urn battery fabricated by *S. Blickman, Inc.* Special flexible hoses, which connect either to the repouring line or to the coffee faucets, facilitate direct filling of large containers on trucks or other rolling conveyances. The equipment consists of two urns and pressure boiler, and is especially suited for inplant feeding requirements as well as for the special needs of individual catering firms serving "coffee break" periods.

American Can Company has developed a revolving plastic disc which can be used for pouring or sifting a variety of food and non-food products. The disc fits snugly and flatly into the recess of a modified end of a Canco sanitary-type container and revolves easily to the desired position to open, sift, pour, or close. The disc, which the firm believes will broaden the use of metal cans for many products now sold in other types of containers, has two die-cut openings, one a pie-wedge shape and the other a cluster of small round holes. After the can has been opened through the pie-wedge opening, it will open easily, pour bulky products, become a sifter, and can be closed tightly for storing.

The *Griswold Manufacturing Company* introduced in May a new satin chrome "counter liner" which contains a fry kettle, a food warmer, and a griddle. The fry kettle turns out 1 per cent more food per hour, using 3 per cent less fat, than standard models. It contains a lift-out fat container for easy cleanability. Solid fat is heated to 350°F. in 6 min. The food warmer can hold 32 qt. of round containers, and the griddle is available in 18- or 30-in. sizes with a grease capacity of 1 gal.